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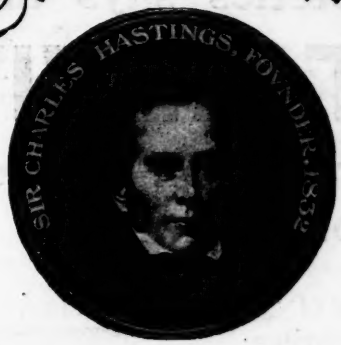

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A Lecture
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THE PRACTICAL IMPORTANCE OF VITAMINES.*

BY
F. GOWLAND HOPKINS, M.B., D.Sc., F.R.C.P., F.R.S.,
PROFESSOR OF BIO-CHEMISTRY IN THE UNIVERSITY OF CAMBRIDGE.

In many departments of human knowledge the teaching and guidance of science are accepted as final because in these departments the knowledge arose in the first instance from scientific studies and from these alone. Progress in such categories depends entirely upon controlled and recorded observation or upon experiment, and these are the methods of science.

It is otherwise, one might be tempted to say, in regions where mankind can claim abundant and accumulated empirical experience. In connexion with his own nutrition man's experience has, needless to say, been coterminous with his whole existence. Science may explain that experience, but is unlikely, it might seem, to improve upon experience as a guide. It may supply theory, but where experience has been so great and so continuous it seems unlikely that it could do much to guide practice. This consideration, consciously or subconsciously, accounts, I think, for a widespread feeling that the teachings of science about our food supply are of academic interest only.

I am to deal, however, with some facts which indicate that, in one direction at least, practice, for lack of knowledge, has for a long time been in danger of going wrong. Experience might doubtless have eventually corrected the error; but it may be hoped that in this case scientific study will forestall experience, which is a much slower and more expensive teacher.

So long as a community can command not only a sufficiency of food, but also a variety of foods, and uses these foods in fresh condition, as nature made them, appetite and instincts (if unperverted) are usually sufficient to secure efficient nutrition for the individual. But when natural foodstuffs are treated artificially—when, for instance, one kind of food material is fractionated, and the consumer presented with a part of it only; or when another material is dried or heated for preservative or other purposes; or, again, when natural foods are sealed up and kept for long periods, it by no means follows that the food materials any longer subserve proper nutrition, even though they are eaten in sufficient quantity and satisfy the appetite.

Now questions of diet are proverbially liable to stimulate quackery, and if I were here to discuss the merits of "natural" foods without giving objective facts I might be suspected of merely supporting certain doctrinaires—self-dubbed "food reformers"—whose zeal outruns their knowledge. There are facts, however, which support the view that where commercial or other enterprise supplies the public with articles of diet which have been treated or "refined" so as to please the eye or to accord with a fashion or convenience, it may be encouraging very wrong practice. Related facts show that the public, when employing tinned or dried or preserved foods, should use them with discretion, and supplement them properly.

To the naïve view that the one important factor in nutrition is the quantity eaten, the science of the last century added one discriminative fact—namely, that quality must be considered as well as quantity, in so far that the food eaten must in any case contain a certain minimum of protein. It taught that the essential constituents of a diet which promotes proper nutrition are protein, carbohydrate, fat, and mineral salts, the organic materials being always provided in sufficient amount to supply the demands of the body for energy.

What we have lately learnt—though it is remarkable how slowly came a recognition of the facts—is that, in addition to the above constituents, which our diets always contain in tangible and easily ascertainable amounts, an efficient diet must also comprise other substances, of which the characteristic is that their nutritive importance is out of all proportion to the minute quantity in which they are normally consumed. This, I would repeat, is one essential fact in connexion with what we have agreed to call accessory food substances or "vitamines." Their influence on the body is great; their amount as they exist in natural foods is apparently exceedingly small. This is one reason why they have for so long eluded recognition.

An Illustration: Milled Rice and Beri-beri.

Before giving further details I will illustrate how great may be the importance to the body of very small amounts of a nutritional factor by reminding you of what still remains the most vivid instance of the phenomena with which we are concerned.

In certain rice-eating communities of the East, in Japan, the Malay Peninsula, the Dutch Indies, the Philippines, etc.—where, owing to various circumstances, the diet is more exclusively confined to the single cereal than is the case in the wheat-eating West—the very serious disease beri-beri is endemic. It is natural for pathologists to look for a positive rather than what may be called negative causation in disease, and after the development of modern bacteriology many unsuccessful efforts were made to find a microbic origin for beri-beri. Long before this, it is true, the view had been held that diet played a part in its production, and the use of rice was blamed. But the view taken was that the cause was *bad* rice—rice infected with moulds or other organisms. Only slowly did the understanding arise, and not till quite lately was proof driven home, that the disease only follows when the rice eaten has been so treated as to lose some essential constituent. The natural grain contains a special constituent necessary to the body. Overmilling removes this. Polished rice, unlike whole rice, is a deficient food. Beri-beri is a deficiency disease, due to reliance upon this food.

Though not duly appreciated at first, evidence for this really came with the arrival in the East of modern milling machinery from the West. This brought a very great increase in the number of cases of beri-beri. Now the native methods of treating rice before eating had been such as to leave essentially untouched certain parts of the grain which the steam mill on the other hand completely removes.

The advent of steam milling and the increase of disease were not at once recognized as being correlated; but, so far back as 1897, there was brought forward what was irrefutable proof that beri-beri depends not upon infection or staleness in the rice taken as food, but upon the treatment the grain had received in the mill. This proof was due to the Dutch physician Eijkman. His statistics dealt with no fewer than 279,621 individuals, all of them at different times prisoners in the gaols of the Dutch East Indies. The different prisons, owing to their different situations, with different and settled local customs, were supplied with different kinds of rice, so the conditions for controlled observations were ready to hand.

In thirty-seven prisons unpolished rice was employed; only one of these prisons developed cases of beri-beri. In thirteen prisons the rice used was polished rice mixed with unpolished; in six of them beri-beri developed. Out of fifty-one prisons, where the rice eaten was entirely of the polished variety, so many as 36, or over 70 per cent., developed cases of the disease. If instead of considering the prisons we count individuals, we find from Eijkman's data that for each 10,000 of the prison population there was only one case among those eating unpolished rice, 416 on the mixed rice dietary, and no less than 3,900 on polished rice. Confirmatory observations have in later years been made elsewhere, but Eijkman's figures are so conclusive that I need bring forward no others. What, then, is removed by the steam mill, of which the importance becomes so evident in its absence? Not the main husk of the grain, for that had nearly always been removed in oriental practice, but just a very thin layer—the "silver skin"—which lies on the outer part of the husk-free seed, together with what we now know to be also important—the germ or embryo. But these structures represent but a very small proportion, indeed, of the total weight of the grain, and we know, as a matter of fact, that the essential thing or things contained in them can amount to but a minute fraction of the material removed. Polished and unpolished rice, as one looks at them side by side, seem to differ so little, that it is almost

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* Delivered in the course of Imperial Studies Lectures on Physiology and National Needs, at King's College, London, February 19th, 1919.

unbelievable that while the latter is an efficient food the exclusive use of the former may lead to fatal results.

But even Eijkman's striking statistics and the facts they brought out did not at once lead to the conception of vitamines. The thought of the pathologist is so accustomed to deal with the positive causes of disease—with bacteria, with some intruder, some *materies morbi*—that he develops a certain habit of mind, and with difficulty believes in causation which has, so to speak, a *minus* sign.

Necessity of Accessory Substances.

I will return later to this particular instance of the evil effects of fractionating a natural food material; for the moment, lest you should associate the subject too closely with the idea of actual disease, I will turn your attention into another channel.

As I have already reminded you, the scientific assumption until a few years ago was that the only essential organic constituents of foods are proteins, fats, and carbohydrates. But the scientific data were mostly obtained during the use of natural foodstuffs, meats, cereals, vegetables, etc. These were of course known to contain many other substances besides those held to be essential, but because, for the most part, they are present in small amounts, the possibility of their importance was always ignored. Clearly the ability of proteins, fats, carbohydrates, and inorganic salts by themselves to support life could only be proved by giving them *pure*.

Suppose now we feed animals with a mixture containing really pure protein, such as purified casein from milk, purified starch, and pure sugar, together with a vegetable fat (I say vegetable fat for a reason which will shortly be made clear), and the requisite mineral salts—what is the result? Not normal nutrition by any means. On such a food young animals fail to grow, and all animals, even adults, sooner or later go to ground.

The full significance of these facts will not be appreciated unless it be recognized that these purified diets are perfectly wholesome; they are fully digested, and may be eaten, so far as quantity is concerned, in ample amount for normal growth and maintenance. Something, however—something clearly of the greatest importance—is lacking. Experiments which prove these statements, and the further discriminative experiments to which I shall refer, have hitherto been made almost exclusively upon animals; for the most part, indeed, upon rats, because of the extreme convenience of these subjects. But for those who feel prejudice against applying results so obtained to the nutrition of man (an unjustifiable prejudice, let me say), I shall later offer facts which make a bridge to the case of human nutrition.

The striking thing, the point that we are now concerned with, is the extremely small amount of material which as an addition will, if rightly chosen, convert these wholly inefficient artificial diets into efficient ones. In some early experiments of my own, for example, the addition was a minute amount of milk. The amount of solid matter contained in this added milk represented at most 3 or 4 per cent. of the whole food eaten by the animals, and as most of the constituents supplied in it were already in the diet, any special substance must have formed a very small proportion indeed of the whole supply of food. Yet without this small addition young animals did not grow; with it they grew satisfactorily. With it they lived; without it they ultimately died. Similar results are got by the addition of equally small amounts of other materials, but they must be preparations made from plant or animal tissues. They must contain something made originally by living cells. All our natural foods are parts of tissues which have lived. We ultimately owe our supply of them to the plant, and the plant evidently makes and stores in very small quantity certain substances which are, as experiment proves, as important to the animal and to the human body as the proteins and the starch which it makes in so much larger quantity. Except for those who view nutrition too exclusively from the standpoint of energy supply, there is no reason for surprise in this circumstance.

What should be clearly grasped is the fact that, without the minute quantities of accessory substances, perfectly wholesome and, indeed, from the standpoint of their own functions, absolutely necessary foodstuffs, are not, in any complete and proper sense, utilized at all. They are absorbed, and the energy contained in them is liberated in the body, but the co-ordination of metabolism is absent, and neither material nor energy is employed aright. When the minute addition is supplied these very same foodstuffs become perfectly available as a whole. We may think of such facts in terms of a very rough analogy. If a house is to be built it is bricks and wood which bulk largely in the necessary supply. The bulk of necessary nails is out of all proportion small, and even that of the mortar is relatively small; but it would be impossible to erect a normal house without at least a minimal supply of nails and mortar. Without them the rest of the building materials would, from the standpoint of a future tenant, be useless. From the facts just dealt with, and from those brought to light from the study of beri-beri, the conception of vitamines emerges. The analogy just used may indeed be wrong. Vitamines may not be concerned with the structure of the tissues, but rather as stimulants or catalysts, with dynamic processes in the tissues. In any case they are nutritive essentials not directly concerned with the supply of potential energy.

Varieties of Accessory Substances.

The question will be immediately asked: What, then, is the actual nature of such substances? It must be confessed that we do not yet know. Patient efforts have already been made to effect their isolation, but success has not yet come. But their nature is perfectly objective. We can extract them, precipitate them, redissolve them, but we cannot yet get them completely separated from other substances, and until we can do so we cannot determine their chemical nature. But many facts have been garnered concerning their general character and behaviour, and what in particular we have learned in the last four or five years is to be sure that there is more than one of these substances. There are indeed at least three, each one of them having its own function in nutrition.

Consider first, very briefly, the evidence for the existence of two of them. Suppose an animal to be upon artificial diet such as I have already described; normal growth will fail as we have seen. But suppose the fat supplied in the artificial mixture to have been butter or almost any other animal fat. Then growth will occur if we merely add to the mixture small quantities of watery extracts made from various plant or animal tissues. A watery extract of the wheat grain, for instance, and especially of the cortex or embryo of the wheat; or, as it is interesting to know, of the "polishings" which are removed when rice is milled. A substance soluble in water, and that in small quantity, is all that is necessary to convert the, by itself, useless diet into a useful one. Suppose, however, that instead of an animal fat we have supplied in the original mixture a pure vegetable fat. Then the addition of the just mentioned watery extracts alone may be quite ineffective; they fail to make the dietary one which will sustain the animal. Replace, however, the vegetable fat with butter once more, and, given the watery extract, the animal will thrive. Now the vegetable fat is a perfectly good food. As fat, as serving the special purpose of fat itself in the body, there is no reason to doubt that it is as good as animal fat. But it lacks some constituent which the latter contains, though that something is once more present in very small amounts. It will be seen at once to what this evidence tends. There are at least two vitamines of importance to nutrition: one associated with certain fats, and one soluble in water. *Both* must be present in sufficient amount in any dietary providing proper nutrition. Following American suggestion, we now speak of them respectively as the "Fat-soluble A" and the "Water-soluble B."

The absence of the fat-soluble vitamine from vegetable fats is not due to its absence from the vegetable structures—seeds, etc.—from which the fats are derived, but to the fact that it is left behind when the fats and oils are expressed or extracted. It is abundant in butter, and is present, as I have said, in most animal fats, but it is, strange to say, absent—or said to be absent—from lard. Now of the water-soluble substance there is one statement which I think can to-day be safely made. It is of special interest because it links these animal experiments with human experience. The water-soluble vitamine, proved requisite for growth, is the very substance which is necessary for the prevention of beri-beri. It is the substance which rice loses when it is "polished."

TABLE I.—*Showing the Relative Distribution of "Fat-soluble A" and "Water-soluble B" Substances in Certain Natural Products.*

The relative quantity of either, when present, is indicated by the number of *plus* signs.

	Fat-soluble A.	Water-soluble B.
Wheat embryo	++	+++
Wheat bran	+ ?	++
Wheat endosperm	−	−
Lean meat	+	+
Egg yolk	+++	++
Milk	+	+
Butter	+++	−
Vegetable fats	−	−
Cabbage	++	+
Potatoes	+	+
Yeast...	+	+++

I return to beri-beri for a moment. One of the special characteristics of that disease is a disturbance in the nutrition of the nerves. A degeneration of the nerves occurs, with accompanying paralysis. Now birds, when fed exclusively upon polished rice, display this particular symptom in a very typical manner, and the fact enables us to perform careful controlled experiments, such as are necessary for determining the distribution of the water-soluble vitamine or, as it may also now be termed, the "antineuritic" substance. After, say, three weeks upon a diet of polished rice a pigeon or a fowl will suddenly develop acute symptoms of paralysis. It is quite easy to cure or prevent these symptoms by adding other foodstuffs to the rice, and if known amounts of them are added it is possible to estimate approximately the relative richness of various foods in this water-soluble or antineuritic factor.

So much for the water-soluble vitamine. Is, now, the deprivation of the factor associated with fats also followed by symptoms of actual disease? The experimental study of its effects is more difficult than in the case of the other factor. Deprivation of the latter is almost immediately felt; but in their own fat stores animals possess a supply of the fat-soluble vitamine, and when it is absent from their diet they seem able to mobilize this supply for the purposes of their active tissues. Not till this internal store is exhausted, or reduced to some minimal value, is its absence from the diet fully felt. Clearly, different individuals will, either from differences in their previous nutrition, or from idiosyncrasy, vary in respect of their store of fat and its associated vitamine. It is more difficult, therefore, in the case of the fat-soluble factor to obtain completely consistent results during experimental feeding. Nevertheless, all animals ultimately fail when this factor is missing from their food.

Rickets.

The probability is growing that there is one disease—and it is a disease of serious import to the community—in which a dietetic error related to a deficiency in the fat-soluble vitamine plays a causative part. I allude to rickets. We have in this connexion, it is true, not yet the concordant evidence from various sources which exists in proof of the origin of beri-beri or of the general importance of vitamines. The case depends at the moment mainly upon the remarkable experimental results obtained by my friend and former pupil Dr. Edward Mellanby; but his work is by no means without the support of other evidence. It is easy, he has found, to construct a diet upon which dogs, though kept in healthy surroundings and given exercise, speedily develop the characteristic symptoms of rickets. It is easy to prevent this by suitable additions to the dietary, in particular by giving certain fats. The fats which are specially efficacious are those which, from other evidence, we know to be rich in the fat-soluble vitamine. Vegetable fats, free from the vitamine, are without effect. The conclusion seems to be inevitable that in some way—on lines, perhaps, not yet fully cleared up—rickets arises when fat-soluble vitamine is deficient in the food. Other factors, such as a generally deficient hygiene, may be contributory, but I for one am quite convinced that the dietetic error is the primary cause. No whit less important is the fact demonstrated by Mrs. Edward Mellanby that deficient diets, such as those which induce rickets, also involve grave errors in the growth of teeth in young animals. We have had little suspicion until lately that the quality of the fat supply in the diet could have an effect such as this.

As a fat rich in the vitamine and capable of preventing rickets in dogs cod-liver oil stands pre-eminent. It has been long known that the oil favourably influences the course of rickets in infants, a fact discovered empirically and without knowledge of vitamines, but a successful therapeutic measure is much more likely to gain general credence and to establish itself in practice if a rational basis for it is made clear. Moreover, the recent attention given to the importance of qualitative factors in food has led to the use of cod-liver oil in the prevention of rickets, with successful results. These bring observations upon human infants directly into line with Dr. Mellanby's experiments. The following are striking figures relating to infants in a negro community of the United States. In this community the dietetic standards are low and unsatisfactory, and its children are greatly prone to rickets.

TABLE II.—*Showing the Results of Administering Cod-liver Oil to Children for the Prophylaxis of Rickets.*

Total Oil Administered.	Duration of Treatment.	No. of Infants.	Infants Developing Rickets.	Percentage of Non-rachitic.
54 oz.	6 months	32	2	93
23 oz.	6 ,,	5	1	80
21 oz.	4 ,,	12	5	58
None	—	16	15	6

Scurvy.

In the case of the disease scurvy, which arises when no fresh foods are available, the cause is again deficiency in a subtle but indispensable element for nutrition. We learn from this disease that at least one other vitamine exists quite distinct from the two hitherto considered. The antiscorbutic factor, unlike the antineuritic or the fat-soluble substance, is very unstable. These last show considerable resistance to heat and do not necessarily disappear when foodstuffs are kept, even for long periods, whereas the antiscorbutic substance is rapidly destroyed when fresh foodstuffs are heated, dried even at low temperatures, or kept too long.

Pellagra.

Another disease which may be mentioned is one to which maize-eating communities are prone. I allude to pellagra. I do not propose to discuss it; but, to show how wide a ground the subject of this lecture may ultimately be found to cover, I would point out that the many theories as to the origin of pellagra which have previously held the ground seem at the moment to be giving way under the pressure of facts, and to be yielding to the view that pellagra, too, is due to the absence of some specific necessary nutritional factor from the diet.

Effects of Partial Deficiency of Accessory Substances.

It would be grave error to deny that such facts and considerations as have been now discussed are of practical and even of national importance. Our troops abroad during this war have suffered from scurvy, as they have in previous wars. Wherever bodies of men—soldiers, sailors, or explorers—are long removed from the sources of fresh foods, scurvy is wellnigh inevitable. But the severe sufferings which were undergone during the siege of Kut, for instance, might never have occurred if the authorities responsible for the equipment of the expedition had had real belief, such as grows from scientific study, in the importance of antiscorbutics rather than the half-faith which is common, especially had they possessed the quantitative information available as to the distribution of the antiscorbutic factor in different materials.

At home the variety in our foods may be sufficient to secure that actual deficiency disease shall, so far as adults are concerned, remain absent. If the necessary accessory

factors are missing from one article of diet they will probably be supplied in others. It is by no means so sure that this remains true in the case of the child population. I would ask you here to give your attention to certain matters of fact, hoping that you will not think them trivial because they concern foodstuffs that are so familiar.

First consider our bread supply. The ancient controversy concerning the relative merits of brown and white bread has been tainted by prejudice. We have had enthusiasm without knowledge on the one side, and, to some extent at least, we have had the influence of trade interests on the other side. I hold no brief for whole-meal bread. I think the well-fed and well-to-do public may be justified, now the war is over, in insisting upon returning to its very white loaf, if this loaf suits its tastes and appetite better than any other. Other articles eaten will surely supply any deficiency. It is well to face the facts, however. The elaborate milling, the "refining" which the wheat grain suffers before it appears in the form of our white flours, deprives it entirely of its water-soluble vitamine. If our pure white wheaten flour were in this country to form so large a proportion of the whole diet as rice does in the East, beri-beri would with certainty appear among us. Indeed, in certain limited communities it is said to have followed the use of white bread. The wheat grain, no less than the rice grain, shows that an essential nutritive factor may have an unequal and limited distribution in a natural product, and illustrates the danger of "fractionating" natural foods to which I referred in my opening remarks.

It is clear that the danger of any deficiency in bread becomes the greater the more it bulks as a constituent of the whole diet. In the case of the poor—and especially the children of the poor—it undoubtedly bulks largely. Consider again the question of margarine as a substitute for butter. If the margarine is made wholly of vegetable fats, it lacks the fat-soluble vitamine. It is not by any means a trivial point to remember that brown bread and butter is, from the standpoint of vitamine supply, an excellent combination, while white bread and margarine may be a desperately bad one. Speaking in parenthesis, I may say that I happen to be aware from personal knowledge that the margarine industry in this country is quite alive to the significance of the facts. Given full liberty of action, the trade is, I believe, both willing and able to turn out products free from the reproach of this deficiency.

We must remember, again, that polished rice contributes not a little to the table of the poor, especially in some districts, and is often eaten plain boiled. Many of the advertised proprietary breakfast foods and invalid foods are practically devoid of vitamine.

In connexion with the antiscorbutic vitamine in particular, let it be called to mind that tinned foods are largely used in poor households—for one thing, because they often need no cooking. In these very households salads are rare, and during those periods of the year when fruit is dear extraordinarily small amounts of fresh foodstuffs are consumed.

Yet, it may be said, in spite of all this, beri-beri or pellagra or any disease like them is unknown in this country; and scurvy is, to say the least of it, very rare. But disturbances in health may exist without arriving at the extreme stage when the appearance of a severe set of symptoms leads to the recognition of actual disease. In particular is this true of conditions of malnutrition, and, unless the considerations I have put before you are wholly baseless, malnutrition may arise irrespective of the quantity of food eaten. It may depend not upon insufficient food but upon badly treated foods or upon an ill-chosen combination of foods. There is no point in all that I have said that I would like to emphasize more than this: Absence of an essential vitamine from the food means disease; but no more than a relative deficiency of a vitamine may mean bad nutrition. In my own opinion at least the diets of the poor—and once again it is the children who are chiefly concerned—often display such deficiency. In connexion with a point such as this a study of national supply, or even of family budgets, gives only partial information. Even when the total family food-budget is satisfactory, ignorant and ill-judged feeding of the child members is both possible and common.

The worst of it is that at present the facts are not generally recognized, even by the medical profession, and the ill health with which such deficiencies as we have been considering are associated is, in my belief, misunderstood and wrongly treated.

The case of rickets, however, stands out. Rickets is very common in this country. True rickets is a disease which, though crippling, is not fatal in itself. It is, nevertheless, a factor of supreme importance to the country because of its indirect effect upon the infantile death-rate. The child who is rickety is much more prone to other ailments—much more vulnerable in all respects—than a normal child. I will not dogmatize with regard to its origin. The mere suspicion that it may be due to a specific dietetic error, such as a deficiency in the supply of the fat-soluble vitamine, should awaken instant interest. Once we are convinced of the primary importance of this factor it will become of national importance to look to the question not alone of the quantity, but of the quality, of the fat in the diets of infants and of nursing mothers.

Mention of the nursing mother brings me to my last point. Evidence has accumulated to suggest that vitamines are not made in the animal body. The animal depends ultimately upon the plant for a supply. They accumulate in the tissues of herbivorous animals, and there, as well as in the plant, they are available for human consumption. But if vitamines are not made in the body at all, this means, in the case of the nursing mother, that if she consume a diet deficient in vitamines her milk may ultimately become deficient—to the complete detriment of the nutrition of her child. Animal experiments have already revealed such deficiencies in milk. It will be seen that the whole question of infant feeding is one in which a knowledge of these special accessory food factors is particularly important. The deficiencies which we have been considering are indeed of more urgent importance in connexion with the nutrition of the young than when adults are concerned. Hence what I believe to be the national importance of the subject. Whether this importance prove ultimately to be less than some of us believe, or whether—for this is quite possible—it may prove to be of as yet unsuspected importance, it should in any case awaken public interest. We are yet at the bare beginning of its study.

A Collective Investigation

OF

TEN THOUSAND RECRUITS WITH DOUBTFUL HEART CONDITIONS.

Conducted at the National Hospital for Diseases of the Heart by C. CHAPMAN GIBBES, R. O. MOON, S. RUSSELL WELLS, P. HAMILL, FREDERICK W. PRICE, *and* J. STRICKLAND GOODALL.

REPORT III,*

COMPILED BY

S. RUSSELL WELLS, M.D., B.Sc.

THE ETIOLOGY OF AORTIC REGURGITATION.

IT has been found extremely difficult, on account of the large amount of material with which we have to deal, and the number and variety of the problems that present themselves, to treat the different questions in logical order. In many cases the questions at issue are so intermixed that when the solution of any particular problem is attempted it is found necessary to solve another first. In our last report we dealt with the incidence of certain general diseases in our whole 10,000 cases, and arrived at the conclusion that there was a slight but definite correlation between a history of rheumatic fever and chorea, but no correlation between a history of rheumatic fever and either a history of "rheumatism," growing pains, or tonsillitis. We stated that the importance of these disorders as

* Part I was published in the BRITISH MEDICAL JOURNAL, May 18th, 1918, p. 556; Part II, September 7th, 1918, p. 248.

efficient causes in producing valvular lesions "could only be determined by a detailed examination of the etiological factors in the different cardiac disorders." Before undertaking such an investigation it was necessary to classify our material according to the various valvular and other defects. Diagnosis during life of cardiac lesions, however, is a question of opinion and not necessarily of fact; therefore before dealing with the etiology of aortic regurgitation, for instance, we should first discuss in detail the data on which the diagnosis was made, and this discussion would again lead us down side-paths which need not now be particularized. The result would be that all continuity of thought would apparently be lost in the presentation of our conclusions; we therefore propose first to discuss the etiology of certain affections of the heart, as far as our cases are concerned, reserving the reasons for our diagnoses for later communications, though some of these communications are already written. While asking the reader to suspend judgement for the time being, we desire to record the fact that the diagnoses have in all cases been arrived at as the result of physical examinations only, and that the etiological factors, such as a history of acute rheumatism and the like, have in no case been taken into consideration in arriving at a decision. Since physical signs alone enable a diagnosis of aortic regurgitation and mitral stenosis to be made with a considerable degree of certainty, we shall treat of the etiology of these lesions first; moreover, since it is generally admitted that the diastolic murmur over the base and down the sternum, which is characteristic of aortic regurgitation, and the apical presystolic and apical diastolic murmurs of mitral stenosis are as a rule associated with structural lesions of the valves, and hence are not likely to be confused with the so-called functional murmurs, there is a distinct advantage in investigating the etiology of these affections before proceeding to more debatable ground.

AORTIC REGURGITATION.

Etiology.

In dealing with the etiology of the cases of aortic regurgitation it must be pointed out in the first place that the cases dealt with were all between the ages of 16 and 42. Consequently, those causes which act late in life necessarily will not figure as prominently as those which occur earlier. It may also be suggested that, since we are dealing with a selected population, the medical boards may have sent a preponderance of a particular class. This, however, is hardly likely, for the War Office instruction was that cases only should be sent in which a doubt as to the classification for military purposes had arisen, and there is no reason to suppose that cases of aortic regurgitation due to any particular cause are likely to furnish a larger proportion of doubtful cases than those due to any other cause. The causes to which aortic regurgitation has been assigned are very numerous, including a great variety of microbic infections, but it is generally recognized that acute rheumatism is one of the commonest. Chorea, and the vaguer and slighter forms of rheumatism described as "growing pains" and the like, are credited with producing it in many cases. An increasing volume of opinion seems to exist which credits syphilis with being the efficient cause of a large proportion of cases; it has been stated that as many as 41 per cent. of aortic regurgitants show evidence of the presence of syphilis. The gonococcus is likewise suspect, while many consider that severe and continuous muscular strain is a common cause of the affection. The arterial changes grouped as atheroma are undoubtedly found, *post mortem*, to be the immediate cause of aortic regurgitation in many cases, particularly in later life, but this is a pathological phenomenon and a proximate rather than an original or true cause, and the question still remains—What was the cause of the atheroma?

Out of the 10,000 recruits examined 307 cases were considered to be definite examples of aortic regurgitation. In all of these a diastolic murmur was audible over the base or down the sternum, though the point of maximum intensity was not always over the aortic area, and in practically every instance other signs suggestive of aortic regurgitation were found. In many cases there was reason to believe that other lesions were present as well. The following table shows the distribution of the 307 cases according to the diagnoses arrived at.

TABLE I.—*Cases of Aortic Regurgitation.*

Diagnosis.	No. of Cases.
Pure Aortic Lesions:	
Aortic regurgitation alone	94
Aortic regurgitation and aortic stenosis	14
Aortic regurgitation and doubtful aortic stenosis	16
Mixed Lesions:	
Aortic and mitral regurgitation	112
Aortic and mitral regurgitation and aortic stenosis	5
Aortic regurgitation and mitral stenosis	15
Aortic and mitral regurgitation and mitral stenosis	33
Aortic and mitral regurgitation and aortic and mitral stenosis	4
Aortic, mitral, and tricuspid regurgitation	1
Aortic regurgitation and old pericarditis	8
Aortic and mitral regurgitation and old pericarditis	2
Aortic and mitral regurgitation, mitral stenosis, and old pericarditis	3
Total	307

With a view to elucidating the influence of the various suggested factors in the production of aortic regurgitation in cases of men up to 42 years of age, the histories of the recruits have been analysed.

TABLE II.—*Giving a Comparison between a History of Various Antecedent Diseases and a History of Strain in the whole 10,000 Recruits on the one hand, and like Histories in the 307 Aortic Regurgitants on the other.*

Possible Etiological Factor.	Total 10,000 Recruits. No. of Cases.	Total 10,000 Recruits. Percentage of Total 10,00 .	307 who showed Definite Signs of A.R. No. of Cases.	307 who showed Definite Signs of A.R. Percentage of 307 A.R.'s.
Rheumatic fever*	1,921	19.2	162	52.8
Chorea	265	2.6	20	6.5
"Rheumatism"	1,613	16.1	55	17.9
Growing pains	2,649	26.5	84	27.3
Tonsillitis	2,210	22.1	60	19.5
Scarlet fever	2,185	21.8	71	23.1
Diphtheria	728	7.3	22	7.2
Pneumonia	537	5.4	20	6.5
Influenza	5,629	56.3	142	46.3
Syphilis	200	2.0	11	3.6
Gonorrhoea	596	6.0	16	5.2
Strain	2,711	27.1	113	36.8

A.R. = Aortic regurgitation.

* No case was credited with rheumatic fever unless there was a clear history of pain and swelling in the joints, fever, and an illness necessitating confinement to bed over a period of some weeks. Some recruits naturally gave a history of more than one of the diseases recorded above.

It will be seen that the aortic cases give a strikingly higher percentage of histories of rheumatic fever than the average, and that they also show higher percentages of histories of chorea and strain. The absence of marked differences of percentages in the other groups makes us doubtful whether a history of these ailments in the cases of aortic regurgitants is not merely accidental.

The percentage method of investigation is open to so many sources of error in numbers like these, that while drawing attention to the figures for rheumatic fever and strain, we do not wish to base any conclusions on the table just given alone. There is, however, another method by which the problem may be investigated. We can calculate the correlation coefficient for aortic regurgitation and each of the factors which may be in etiological relation with

it.* One hundred and sixty-two cases gave a history of rheumatic fever and symptoms of aortic regurgitation, 145 aortic regurgitants gave no history of rheumatic fever, while 1,759 cases had a history of rheumatic fever but no evidence of aortic regurgitation, and 7,934 cases no signs or history of either. The coefficient of correlation comes out at 0.499, the limit of probable error being $\pm$ 0.015, while $\chi^2 = 229$. This is very definite correlation, and may be defined as from moderate to considerable.

TABLE III.—*Showing the Numbers for the Various Diseases or Possible Causes Investigated, with the Correlation Coefficient, Limits of Probable Error, and Value of χ^2 in Every Case.*

A.	B.	Number of Cases. History of A. and B.	History of A. only.	History of B. only.	No History of A. or B.	Coefficient of Correlation.	Limit of Error.	χ^2.
A. R.	Rh. fever ...	162	145	1,759	7,934	0.499	0.015	229.83
,,	"Rheumatism"	55	252	1,558	8,135	0.039	0.020	0.75
,,	Growing pains	84	223	2,565	7,128	0.016	0.020	0.123
,,	Chorea	20	287	245	9,448	0.179	0 019	18 34
,,	Tonsillitis ...	60	247	2,150	7,543	0.053	0.020	1.20
,,	Scarlet fever ...	71	236	2,114	7,579	0.025	0.020	0.30
,,	Diphtheria ...	22	285	706	8,987	0.004	0.020	0.006
,,	Pneumonia ...	20	287	517	9,176	0.045	0.020	0.82
,,	Influenza ...	142	165	5,487	4,206	0.161	0.019	12.96
,,	Syphilis ...	11	296	189	9,504	0.107	0.020	4.05
,,	Gonorrhoea ...	16	291	580	9,113	0.032	0.020	0.317
,,	Strain	113	194	2,598	7,095	0.164	0.019	15.07

A. = Aortic regurgitation. B. = Etiological factor under consideration—for example, rheumatic fever, chorea, or the like.

The value of χ^2 in the above table is so small in the case of "rheumatism," growing pains, tonsillitis, scarlet fever, diphtheria, pneumonia, syphilis, and gonorrhoea, as strongly to suggest that the system is not really a random sample from material in which the two variates are independent, but that, on the contrary, the two variates are correlated with each other in various degrees. χ^2, however, is sufficiently high in the cases of rheumatic fever, chorea, influenza, and strain, practically to exclude a chance distribution. Before accepting the correlation figures for chorea, influenza, and strain, we have to remember that many cases giving a history of these illnesses also gave a history of rheumatic fever. In view of the well marked correlation of 0.499 $\pm$ 0.015 between aortic regurgitation and rheumatic fever, and the fact that no less than 52.8 per cent. of cases of aortic regurgitation gave a definite history of rheumatic fever, it is obviously dangerous to attribute aortic regurgitation to any other cause, such as influenza, strain, or syphilis, where there is also a history of rheumatic fever.

We therefore propose now to discuss in detail the cases of aortic regurgitation giving histories of the various diseases with which we are concerned, and shall compare the percentage of cases in any group giving a history of rheumatic fever with the percentage of the whole 307 cases that gave this history. It is obvious that if rheumatic fever and any other disease, such as syphilis for example, are both causes of aortic regurgitation, we should expect to find among a random sample of aortic regurgitants giving a history of syphilis a smaller proportion giving a history of rheumatic fever than among aortic regurgitants as a whole; or, put in other words, there would be more without a history of rheumatic fever than among a sample of cases of aortic regurgitation selected without regard to the syphilitic history; while, if syphilis were not a cause of aortic valvular trouble, we should expect the proportion of rheumatic cases to be as big as or bigger than in the whole class. While we have shown in Report II that there is no correlation to be found between a history of rheumatic fever and either one of "rheumatism" or growing pains, and while the percentage and correlation figures just given lend no support to the view that they are efficient causes in producing aortic regurgitation, it is possible that such histories in some of these cases may refer to slighter attacks of the same ailment as that which we have dealt with under the head of rheumatic fever, though the evidence we have already brought forward makes it improbable that they do so as a rule. We have therefore thought it wise to include a heading of "History of 'Rheumatism,' Growing Pains, or Chorea"; the reasons for including chorea will be given under the head of that disease.

There is yet another method by which we can approach the problem. As it is well known that the damage caused by acute rheumatism is by no means confined to one set of valves, and that it frequently produces multiple lesions, we can see if, in cases of aortic regurgitation, there is a great excess of either simple or multiple lesions in those cases giving a history of any particular disease beyond what we should expect if true rheumatism were the cause.

Rheumatic Fever.

One hundred and sixty-two of the 307 cases of aortic regurgitation, or 52.8 per cent., gave a history of this disease, as against 19.2 per cent. of the 10,000 cases examined. The correlation coefficient between a history of rheumatic fever and aortic regurgitation was 0.499 $\pm$ 0.015, while $\chi^2 = 229$. These facts are powerful arguments in favour of rheumatic fever being an important cause of aortic regurgitation. In comparing the ratio of the pure aortic lesions to mixed lesions we thought it wise, in the first instance, to divide our cases into three groups, shown in Table IV:

TABLE IV.—*Group 1, a Clear and Definite History of Rheumatic Fever. Group 2, a Rheumatic History such as "Rheumatism," Growing Pains, or Chorea, but no Definite History of Rheumatic Fever. Group 3, no History Suggestive of any form of Rheumatism.*

Group.	Total	Pure Aortic Lesions.	Mixed Lesions.	Ratio of Aortic to Mixed Lesions.
1. With history of rheumatic fever .	162	70=43.21%	92=56 79%	0.76
2. With history of "rheumatism," growing pains, or chorea	73	29=39.72%	44=60.27%	0 66
3. With no rheumatic history	72	25=34.72%	47=65.28%	0.53
Total	307	124	183	0 68

It will be seen that the ratio between aortic and mixed lesions steadily falls as we pass from Groups 1 to 3, and that in those cases showing no history of any form of rheumatism the largest proportion of mixed lesions occurs. A reference to the table already given of the diagnoses will reveal the fact that in most cases where a mixed lesion occurred mitral regurgitation was present, and as the diagnoses were founded on physical signs alone, and largely on murmurs, this may have been either due to structural damage of the valves or to relative incompetence from stretching of the mitral ring or other causes.

"Rheumatism."

Fifty-five of the 307 cases gave a history of "rheumatism"; 17 of these also gave a definite history of rheumatic fever either before or after the "rheumatism." In the remaining 38 no clear account of rheumatic fever, as we have defined it, could be elicited, though in some there was a history of growing pains or chorea as well as rheumatism

* The formulae used were—

$$Q_5 = \sin \frac{\pi}{2} \frac{1}{\sqrt{1 + K^2}}$$

$$\text{where } K^2 = \frac{4\,a\,b\,c\,d\,N^2}{(a\,d - b\,c)^2\ (a + d)\ (b + c)}$$

Qs being taken as a sufficiently near approximation to r (see Pearson, *Phil. Trans.*, 1900, series A, vol. 195).

$$(\text{Poc})\ \chi^2 = \frac{N\,(a\,d - b\,c)^2}{(a + b)\ (c + d)\ (b + d)\ \ a + c)}$$

$$\text{Error: } \pm\ 2.02347 \times \frac{1 - r^2}{\sqrt{N}}$$

TABLE V.—*Comparison of the 307 Aortic Regurgitants with the 55 giving a History of "Rheumatism," as regards the Incidence of Rheumatic Fever.*

	No. of Cases	With History of Rh. Fever.	Without History of Rh. Fever.
Total Ao.R.	307	162=52.8%	145=47.2%
Ao.R. and "rheumatism" ...	55	17=30.9%	38=69.1%

The fact that a smaller proportion of cases with a history of "rheumatism" (30.9 per cent. against 52.8 per cent.) give a history of rheumatic fever than the whole 307 do, suggests that "rheumatism" may have been the cause of the aortic regurgitation in some of these cases; or, what would come to the same thing, that some cases of the disease we have called rheumatic fever were included in the "rheumatic" group.

Of the 38 "rheumatic" cases without a history of rheumatic fever, 14 were diagnosed as instances of aortic lesions, and 24 as mixed lesions—a ratio of 0.58 as compared with 0.76 for rheumatic fever.

Growing Pains.

Out of the 307 aortic regurgitants, 84 gave histories of growing pains; 48 of these gave a definite history of rheumatic fever as well, and of the remaining 36 some 7 gave a history of either "rheumatism" or chorea in addition to growing pains.

TABLE VI.—*Comparison between the Incidence of Rheumatic Fever in this Group with its Incidence in the whole 307 Cases.*

	No. of Cases.	With History of Rh. Fever.	Without History of Rh. Fever.
Total Ao.R.	307	162=52.8%	145=47 2%
Ao.R. and growing pains ...	84	48=57 14%	36=42.85%

The close agreement between these figures obviously makes it unsafe to attribute aortic regurgitation to growing pains. Of the 36 cases without a history of rheumatic fever 15 were classed as pure aortic and 21 as mixed lesions; a ratio of 0.71, which is practically the same as the 0.76 found in the cases with a history of rheumatic fever.

Chorea.

In 20 cases there was a history of chorea, 10 of these giving also a history of rheumatic fever, 6 of chorea with either growing pains or "rheumatism," and 4 a history of chorea without any other rheumatic manifestation.

TABLE VII.—*Comparison between the Rheumatic History of those Cases showing Chorea and the Rheumatic History of the Total Number of Aortic Regurgitants.*

	No. of Cases.	With History of Rh. Fever.	Without History of Rh. Fever.
Total Ao.R.	307	162=52.8%	145=47.2%
Ao.R. and chorea	20	10=50 0%	10=50.0%

The question arises whether those cases in which there is a history of chorea should be classified definitely with true rheumatism, and put in the same group as rheumatic fever, or not. In favour of such a classification are the facts that chorea is a definite illness, persisting for a long time, and hence it is comparatively easy, from a careful inquiry into the history of the case, to make sure of it having occurred. Since at the present time there seems to be a growing tendency to regard true chorea and acute rheumatism as different manifestations of the same disease, and since there is, as shown in our last report, a certain degree of correlation between a history of chorea and rheumatic fever, we were at first inclined to classify them together, but, on further consideration, it was thought wiser to adopt a more conservative attitude, and to put the chorea cases together with the more doubtful rheumatic manifestations such as "rheumatism" and growing pains, and only to credit to rheumatic fever those cases where there was a history of true rheumatic fever as well as of chorea. One of the considerations which induced us to do this was the fact shown in the above table, that the proportion of chorea cases giving a history of acute rheumatism—namely, 50 per cent.—was practically the same as the proportion of total cases of aortic regurgitation giving a similar history, which was 52.8 per cent.

Of the ten cases without a history of rheumatic fever, three were considered to be examples of pure aortic lesions, and seven of mixed lesions—a ratio of 0.43. The numbers are, however, too small to be worth considering.

Tonsillitis.

Tonsillitis is considered by some to be an affection of rheumatic origin; others, while not admitting this, yet consider that it may be the cause of valvular affections. Confining ourselves for the moment entirely to aortic regurgitation, we may say at once that our figures for these cases afford but little support of these views. Sixty cases in all—that is, 19.5 per cent. of the 307—gave a history of tonsillitis, but in 40 there was also a history of rheumatic fever, and in 7 one either of "rheumatism," growing pains, or chorea. In other words, in 78.3 per cent. there was a possible rheumatic history, and in only 21.7 was this absent.

TABLE VIII.—*Tonsillitis.*

	No. of Cases.	With Rh. Fever.	With Rh., G.P., or Ch.	Without Rh. History
Total Ao.R.	307	162=52 8%	73=23.8%	72=23.4%
Ao.R. and tonsillitis ...	60	40=66.6%	7=11.7%	13=21.7%

G.P. = Growing pains; Ch. = chorea.

The ratio between the cases showing pure aortic lesions and those with mixed lesions was 0.58, as against 0.76 for rheumatic fever; while of the 20 without a history of rheumatic fever 6 show pure aortic lesions and 14 mixed—a ratio of 0.43, so that here there is a preponderance of mixed lesions.

Scarlet Fever.

Scarlet fever has been regarded as a not uncommon antecedent of valvular lesions; but, as this fever is not infrequently followed by a fever bearing a close resemblance to acute rheumatism, many have thought that the valvulites following scarlet fever are really of rheumatic origin. The figures for these cases give a slight support to this view. In 9 out of the 45 cases where rheumatic fever and scarlet fever both occur, the rheumatic fever followed immediately after the scarlet fever—that is, in 20 per cent. of the cases there was a close connexion between them. In the remaining 36 cases the two diseases were separated by some years.

Seventy-one out of the 307 cases—that is to say, 23.1 per cent.—gave a history of scarlet fever. In 45, as mentioned already, there was a history of rheumatic fever; in 13 a history of either "rheumatism," growing pains, or chorea; in 13 there was no history of any rheumatic affection.

TABLE IX.—*Contrasting the Total of Aortic Regurgitants with those giving a History of Scarlet Fever, showing a Slight Preponderance (63.4 per cent. as against 52.8 per cent.) giving a History of Rheumatic Fever where Scarlet Fever had also occurred; in the Scarlet Fever Group there is rather a Smaller Proportion with no Rheumatic History.*

	No. of Cases.	With Rh. Fever.	With Rh., G.P., or Ch.	Without Rh. History
Total Ao.R.	307	162=52 8%	73=23.8%	72=23.4%
Ao.R. and scarlet fever	71	45=63.4%	13=18.3%	13=18.3%

Ratio of Pure to Mixed Lesions.—In 27 cases lesions of the aortic valve alone were diagnosed, in 44 the mitral valve was also affected—a ratio of 0.61 against 0.76 for the cases with a history of rheumatic fever. Of the 26 cases without a history of rheumatic fever, 8 had pure aortic lesions and 18 mixed—a ratio of 0.4, so here, as in the case of tonsillitis, mixed lesions predominate.

These results do not in themselves lend any support to the view that scarlet fever is an efficient cause of aortic regurgitation.

Diphtheria.

Of the 307 cases of aortic regurgitation 22, that is, 7.2 per cent., gave a history of diphtheria.

TABLE X.—*Showing the Distribution of Cases with a History of Diphtheria and a Comparison between them and the Total Aortic Regurgitants with regard to their Rheumatic History.*

	No. of Cases.	With Rh. Fever.	With Rh., G.R., or Ch.	Without Rh. History
Total Ao.R.	307	162=52.8%	73=23.8%	72=23.4%
Ao.R. and diphtheria ...	22	15=68.2%	5=22.7%	2= 9.1%

A comparatively large proportion of these cases were pure aortic lesions, namely, 13 as against 9 with mixed lesions, the ratio here being 1.44 instead of the ratio 0.76 shown by the total number of aortic cases with a history of rheumatic fever. Of the 7 cases without a history of rheumatic fever, 4 were pure aortic lesions and 3 mixed—a ratio of 1.3.

These figures cannot be said to lend any support to the idea that diphtheria is a cause of aortic regurgitation, but the large proportion of pure aortic cases in this group is interesting, though it may well be accidental.

Pneumonia.

The proportion giving a history of pneumonia is not large, 20 cases in all, that is, about 5.9 per cent. of the total 307 cases. Twelve of these gave histories of acute rheumatism, 2 of some rheumatic affection, and 6 no rheumatic history. Here again, as the table shows, there is no evidence from the figures that pneumonia is in itself a cause of aortic regurgitation.

TABLE XI.—*Pneumonia.*

	No. of Cases.	With Rh. Fever.	With Rh., G.P., or Ch.	Without Rh. History
Total Ao.R.	307	162=52.8%	73=23.8%	72=23.4%
Ao.R. and pneumonia ...	20	12=60.0%	8=10.0%	6=30.0%

Since an attack of pneumonia is apt to affect the muscle of the ventricles, it is not surprising that these cases of aortic regurgitation with a history of pneumonia show a larger proportion of mixed lesions than is shown by the 162 cases with a history of acute rheumatism; the ratio of pure aortic to mixed lesions being 0.43 where pneumonia had occurred, as against 0.76. The cases without a history of rheumatic fever comprised 2 cases of pure aortic lesions and 4 of mixed, a ratio of 0.5.

The analysis of these cases is against pneumonia being a cause of aortic regurgitation.

Influenza.

As judged by these cases, influenza is but of little importance in the production of aortic regurgitation. Of the 307 cases, 142 (46.3 per cent.) gave a history of one or more attacks of influenza, but in 82 of these there was also a history of rheumatic fever, and in 31 a history of chorea, "rheumatism," or growing pains—that is, in 79.6 per cent. there was a possible rheumatic history.

TABLE XII.—*Influenza.*

	No. of Cases.	With Rh. Fever.	With Rh., G.P., or Ch.	Without Rh. History
Total Ao.R.	307	162=52.8%	73=23.8%	72=23.4%
Ao.R. and influenza ...	142	82=57.7%	31=21.8%	29=20.5%

The ratio of pure aortic to mixed lesions was 0.73, which is very similar to that of the total number of aortic regurgitants with a history of rheumatic fever. Of the 60 cases without a history of rheumatic fever, 21 were pure aortic cases and 39 were instances of mixed lesions, the ratio being 0.5, against 0.76 for the whole of the cases of aortic regurgitation with a history of rheumatic fever.

(*To be continued.*)

A PLEA FOR THE HOMOGENOUS NERVE GRAFT.

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IN the majority of cases of complete nerve division that have resulted from gunshot injury the nerve ends are capable of approximation for suture when operation is performed for this purpose. But there are quite large numbers in which approximation is not possible owing to the destruction of a considerable segment of nerve trunk, together with extensive tissue loss. Many such a case has been operated upon, and the surgeon who has been confronted with the problem of how to make good the loss has failed to proceed further or has resorted to one of various illogical expedients, without, in my experience, any good result.

As surgical specialist to the Pensioners' Resurvey Boards at the Duke of York's Head Quarters I have had ample opportunity of observing these results, and I have seen no instance of recovered nerve function where bridging with foreign material has been done, or where the nerve ends have been connected by a wrapping of fascia, Cargile membrane, or vein. If Van Lair's experiments are to be relied upon, it is inconceivable how anatomical union can by such means occur.

He found, as a result of nerve trunk excisions in animals, that where a space of 4 cm. was left between the nerve ends no recovery occurred; with an excision of 2 cm., recovery did not occur for thirty months; with a 1 cm. excision, recovery of function was delayed to fourteen months; whereas in the case of approximation and suture, recovery occurred in eight months.

These experimental operations were aseptically performed so that there would be absence of scar tissue and the circumneural areolar and fatty tissue left would offer but little obstruction to growth, if any, furnishing rather an admirable conducting sheath to support and direct the growing nerve fibres in a correct course were this all that was required.

But it is clear that something more than a conduit is necessary. It is recognized that the neurilemma elements are essential to sustain and nourish nerve fibres in their growth. Where interrupting scar is present, as it invariably is in gunshot injuries, it is doubtful if the smallest breach is passed. Wherever a nerve has been wounded and divided, completely or in part, palpation will reveal the presence of a neuroma, which means a mechanical and functional block, and my experience is that until this block is removed and direct approximation of healthy elements obtains, function is not restored, in spite of massage, electricity, and other futile means wastefully expended over a period of years. It is not reasonable to expect growing fibres, after being contorted in scar, to traverse such a bewildering obstacle and reach their destination. Thus excision of a lateral scar the result of a lateral notch is perforce a recognized operation.

In view of the large number of pensioners still languishing with disabilities that are the direct result of sectional nerve lesions it is fortunately proving by accumulating evidence that lapse of time should be no deterrent against suture. The longest period that has elapsed between section and suture of the cases I have observed that have been followed by recovery is two years and seven months. This was a case of complete ulnar nerve division.

The results in general of nerve suture as they appear at the Resurvey Boards are remarkably good, and the degree of restoration of function is found on palpation to be in inverse ratio to the development of a neuromatous swelling where junction has been effected. Conformity at the site of union approximates the normal when coaptation is exact and restoration of function is complete; whereas if operation results in failure, marked neuromatous swelling occurs, which is a help in deciding for reoperation without undue delay. "What is anatomically correct will not be physiologically wrong" is a phrase that in nerve surgery may be taken as a guide if operative results are to give satisfaction. It is not possible to make certain of establishing perfect histological union, but the oval contour and striation of a nerve does permit of coaptation that approximates morphological perfection, so that torsion can be avoided and nerve fibres in their growth are likely on the whole to

find their paths correctly. The sectional area of a nerve has the appearance and manner of a cribriform connective tissue plate, the apertures of which are occupied at the proximal end by severed normal nerve fibres and at the distal end by protoplasmic neurilemma cords of equal number. If nerve fibres in their growth pass into other than their rightful channels, so-called paradoxical regeneration will occur that in mixed nerves in particular is followed by disconcerted and incomplete recovery; but when coaptation of nerve ends is made morphologically exact, such paradoxical regeneration is unlikely, for sensory and motor nerve fibres are not intimately admixed but can be traced throughout their course in separable strands.

A nerve graft fulfils all histological and anatomical requirements. Successfully introduced, it may be regarded as deriving vascularity and nutrition from capillary connexions that must at once form, and as undergoing the same Wallerian degenerative change of its nerve fibres, in common with all medullated nerve fibres severed from their cells. The loose connective tissue which surrounds and is introduced with a graft affords protection and mobility, and is a natural safeguard against adhesion that is so commonly responsible for local tenderness, contracture, irritative phenomena, and pain.

If a nerve graft is to afford a normal channel for every separate axis cylinder growing from above it must have a sectional area at least as great as or greater than that of the nerve trunk itself. Any provision short of this will be inadequate, and will result either in a syndrome of dissociation, a recovery at most of partial degree, or in failure of any recovery owing to the block of a faulty and defective union. Such unsatisfactory results are to be seen by the utilization of autogenous grafts for the median, ulnar, and musculo-spiral nerves when their continuity is re-established by the interposition of segments of cutaneous trunks of small and disproportionate calibre, like the radial and internal cutaneous nerves taken from the same subject. Union by suture of the epineural sheath, so insisted upon by many operators, is in this connexion an essential desideratum in the prevention of block, by eliminating the ingress of scar tissue and the emergence of nerve fibres, which become governed and directed on a normal course.

Homogenous nerve grafts are obtainable from amputation stumps which are being operated upon for painful neuromata, and it is quite feasible that certain men would be donors to their comrades who remain disabled from extensive nerve loss. In such case the time of operation is a matter of arrangement and choice. Opportunity is also afforded when amputation is performed if disease does not contraindicate, but such is only of chance occurrence, and rarely available opportunely. It is possible that nerve segments preserved in a cooling chamber might be employed with success as grafts, but, though I have had them ready in case of need, no occasion has arisen to prove their use, nor have I seen their use reported.

There are considerations other than anatomical which have been dealt with above that contribute to success in nerve reconstruction, but taking for granted a recognized and approved surgical technique, it is the anatomical factor which, in my opinion, counts above all others for or against a good result, and the importance of which as fundamental requires emphasizing. And the anatomical factor as a matter for attentive consideration is not confined to the nerve. The other tissues in the wound area that have suffered injury and loss are replaced by scar tissue, which is the product not of differential regeneration but of repair, in which the cellular elements of the universal connective tissues alone take a proliferating part. The breach of the surface and underlying tissues becomes indiscriminatingly occupied and mended by an inelastic material, binding parts together which should possess free mobility, dragging and distorting them from their normal positions and course, and fixing them to the overlying surface or subjacent bone.

I made it a practice in my military hospital work to excise all adherent scars with the object of reconstituting disturbed anatomy and restoring the mobility and normal function of the various structures. The aching of scars in cold damp weather is real, from loss of the insulating subcutaneous fatty covering; the pain of scars is true, and can be localized by careful palpation to fine neuromatous terminations of divided subcutaneous nerves. Contraction and extension of muscles, free action of tendons, and consequently joint movement, are compromised by adhesion to skin and underlying bone. Nerves by implication evince not only disordered conduction, but distressing tenderness at the affected region both on manipulation and pull, so that attitudinization and protective contracture maintain deformity that resists correction from fear of pain. Many so-called functional cases have in these conditions an underlying cause, a sufficient aggravant in susceptible subjects being an adherent scar by the mere annoyance of its continued drag and pull. All these evils can be eliminated by excision of the scar, which, when an implicated nerve is approached, should be the route chosen rather than another elsewhere.

The foregoing remarks will, I hope, suitably preface the report of a case which I operated upon at St. George's Hospital, a case of extensive loss of the median nerve in which the intercalation of an homogenous graft fifteen months after injury was followed by a result so successful and rapid that I enter a plea for its general adoption and its trial at all events before resorting to tendon transplantation.

J. H. P., aged 32, was wounded on June 7th, 1917, the disability recorded being "gunshot wound of the right forearm with fracture of the radius." When seen by me in August, 1918, there were anterior and posterior long scars in the middle line above the wrist, adherent to and binding the underlying tendons and preventing their free action, especially as affecting extension of the fingers. Beneath the upper end of the anterior scar, which was 4 inches long by ¾ inch broad, a large fixed and tender neuromatous swelling was palpable in the course of the median nerve, giving rise on manipulation to electrical painful sensations referred to the area of cutaneous distribution of the median nerve in the hand, in which there was complete median paralysis and anaesthesia, with sores and other trophic changes. There was shortening of the radius by fracture and sequestration, but union was firm and its alignment good. An undue prominence of the head of the ulna was a consequence, with a disabling outward deviation of the hand.

He was admitted to St. George's Hospital, where I operated upon him on August 30th, 1918. In the first place the posterior scar was excised and the extensor tendons involved were freed. The anterior scar was then excised and the damaged implicated tendons were rectified and freed. All scar tissue as it involved the median nerve was removed, leaving an interval of 4½ inches between the cut ends, the lower being flush with the upper margin of the anterior annular ligament.

Whilst this operation was in progress Mr. Fedden, in an adjacent theatre, was amputating a lower limb through the thigh. The case (female) was one of chronic ulceration, but he was able to reassure me that the Wassermann test was negative. The skin surface was smeared with iodine, and I hastily cut down upon and removed a long portion of posterior tibial nerve, which, being of approximate calibre to the median nerve and abundantly surrounded with a loose fatty covering, appeared ideal for the purpose of a graft. This I dropped into a dish of methylated spirit and inserted in the wound, which was found bloodless on removal of its packing. The introduced nerve was cut to suitable length and sutured with fine catgut in position in accord with the anatomical principles described, a stay suture passed through the body of the nerve and graft first securing the ends, and small interrupted sutures circumferentially placed giving continuity of the sheaths. The wound surface was drenched with methylated spirit, dried, and given the slightest smear of bipp as an inhibitory agent against the development of sepsis. Fascia, skin, and subcutaneous tissue were united by catgut suture, no drainage being employed. Skin approximation was found impossible until linear incisions parallel to the wound on the radial and ulnar borders had first been made, the incisions passing only through the skin, leaving undivided the subcutaneous layer to preserve mobility when epithelialization should subsequently occur. The wounds healed by first intention, and the breaches made in the skin closed in a few weeks' time.

On October 14th, 1918, I performed a second operation, excising three-quarters of an inch of the ulna just above the attachment of the pronator quadratus. Coaptation was found difficult, and from the bone removed a disc the thickness of a shilling was therefore sawn and inserted to make the fit exact. Apposition was effected by a metal plate, the union being made secure and firm by screwing away from the line of junction. The deformity of the hand was thereby corrected. Healing was primary.

The subsequent progress of the case was most satisfactory. The man soon expressed a feeling that the hand was changed, that it felt alive. Tinel's sign was obtainable in the palm within three months' time. At the beginning of February, 1919, five months after the introduction of the nerve graft, an examination was made and the following notes recorded:

Union of the ulna firm; hand in straight alignment with the wrist. Extension of little and ring fingers beyond the straight line prevented by flexor tendon contracture. Hand grip good.

The hand was in a state of good nutrition, all signs of trophic

change having disappeared. There was absence of discomfort, tenderness, and pain.

Sensation to pin-prick wellnigh complete, being present over the whole median area with the exception of the tip of the index finger and the two terminal phalanges of the middle finger. Epicritic sensation present over the whole median area with the exception of the terminal phalanx of the thumb, the whole of the index finger, and the middle and distal phalanges of the middle finger. Thenar muscular power largely recovered, opposition of the thumb being present to considerable degree. Slight faradic response of abductor pollicis observable. Tip of thumb apposable to that of index and middle, not quite to that of ring and little fingers.

The hand at this time was restored to considerable practical use, and the man had resumed his occupation, which was that of a skilled electrician.

HYPERPYREXIAL HEATSTROKE:

A BRIEF NOTE ON ITS ETIOLOGY AND PREVENTION.

BY

K. G. HEARNE, M.B., CH.B.EDIN.

IN a recently written thesis on heatstroke—a disease which I studied in Mesopotamia during the exceptionally hot summer of 1917—the etiology, prevention, and treatment of the condition has been discussed more or less fully. It is impossible here to do more than touch lightly upon a few of the chief points which have a practical bearing on the causation and prevention of the disease. The object of this note, therefore, is to suggest the adoption, in heatstroke countries generally, of the following principles of prevention, which have proved completely successful in Mesopotamia after a prolonged and very thorough test under varying conditions. The remarks on etiology are based on a close study of some 240 cases, many of which occurred in the huts of a large base hospital among patients who were already in hospital with some other complaint, and in consequence an excellent opportunity of observing the disease in all stages of its development was afforded.

Etiology.

As regards etiology, and notwithstanding the diverse theories that are put forth in present-day textbooks on the subject, my observations in Mesopotamia point most conclusively to the belief that heatstroke is entirely due to suppression of sweating, which may be present from one to forty-eight hours *before* the attack.

With sweating suppressed, the bodily temperature tends to adjust itself, in accordance with physical laws, to the temperature of the atmosphere, which may be 115° to 120° at the time, and even to rise higher, for, as Sutton[1] and Graham and Poulton[2] have pointed out, a rise in bodily temperature produces increased respiratory and nitrogenous changes, resulting in a further increase of internal bodily heat. The processes continue until, when a temperature of about 108° or more is reached, sudden unconsciousness, delirium, and convulsions appear—the result of the physical action of heated blood on the specialized brain cells. The clinical picture of the fully developed attack of heatstroke is thus formed.

I have myself repeatedly observed the pre-existence of suppression—in one case for as long as eighteen hours before the attack—while in numerous other instances I have obtained absolutely reliable histories of it from patients on their recovery.

The cessation of perspiration is probably due to exhaustion of the sweating mechanism during several previous days of intensely severe weather, and there is strong reason to believe that the defect is localized in the sweat glands themselves. Furthermore, large doses of diaphoretics are powerless to produce sweating when once suppression has set in.

Prevention.

By the early recognition of suppressed sweating the prevention of heatstroke becomes an extremely simple matter. The practice which I adopted among hospital patients under my charge in Mesopotamia was to inspect them all periodically—every hour on extremely hot days—and to detect in this way those who required preventive treatment; any who were discovered to have a temperature of 103°, with complete suppression, were stripped and covered with a wet sheet. This measure simply amounts to an artificial means of producing the same physical effects as sweating. In cases in which the temperature had already risen dangerously high before discovery a portable electric fan directing a current of air over the surface of the wet sheet was placed beside the bed; the evaporative process was greatly assisted by it.

In mild cases, or where the treatment requires to be maintained for several days until the natural sweating power returns, a convenient modification of the method, and one more comfortable for the patient, is to raise the wet sheet on a couple of bed cradles, thus forming a kind of cool chamber in which the naked patient lies protected from the surrounding hot atmosphere of the hut. With this device the additional aid of a fan playing a current of air over the outside surface is usually necessary in order to produce an efficiently cool atmosphere below the cradles on very hot days.

Needless to say, the sheet requires to be kept wet, and much time and labour is saved by using for this purpose some form of spray, such as the Holder-Harrinan pneumatic disinfecting spray, filled with cold water.

If it were possible to remove the patient to a ward which was artificially cooled to a suitable temperature the individual cooling devices would, of course, be unnecessary. The success of these preventive measures can be judged from the fact that in my hut (sixty beds constantly occupied) at the hospital, nine cases of heatstroke with four deaths occurred within the first few days of the 1917 heat wave, but, directly the preventive system was commenced, the outbreak stopped; only two more cases occurred during the remainder of the heatstroke weather, which lasted continuously for two months. The average number of cases occurring in this district (Basra) during the whole period was nine a day. Neither of the two patients who developed the condition in my hut after prevention had been commenced had been placed under preventive treatment.

It will thus be seen that hyperpyrexial heatstroke is an absolutely preventable disease, the leading signs of onset being a hot dry skin, which is typically harsh to touch, and a raised bodily temperature. There is usually also frequency of micturition. These signs are present from one to forty-eight hours before the attack, consequently ample warning is given. The position is simply this: that the patient, having lost his natural means of heat dissipation, requires his bodily temperature to be artificially regulated for him during extremely hot weather until he again begins to sweat, or until the heat wave abates.

If Europeans in heatstroke countries were made acquainted with the premonitory signs and principles of prevention, I see no reason why heatstroke, in a dry climate at least, should occur. I have had no experience of prevention in extremely humid climates such as Calcutta, where the atmospheric moisture may, possibly, hamper the evaporative process, but have no doubt that such a difficulty, if present, could be easily met by employing some other method of cooling the patient.

Even among troops on the march the principle of prevention is applicable. Water, and something that will act as a fan, are practically always obtainable, thus permitting an efficient form of first aid being applied to any man who exhibits the warning signs.

Among sleeping communities—for example, patients in hospital, or soldiers sleeping in barracks on very hot afternoons during heatstroke weather—periodic inspections are necessary in order to detect developing cases. These inspections can easily be carried out by an intelligent orderly, or staff of orderlies. The patient's general condition can be estimated roughly by touching the skin, and only occasionally is it necessary to take a thermometer reading, while those who are freely sweating can, practically speaking, be entirely disregarded.

In the after-treatment following upon an actual attack of heatstroke the tendency to relapses of hyperpyrexia are treated on exactly the same lines as for prevention. The patient frequently does not regain his powers of sweating for days after the attack.

REFERENCES.

[1] Sutton: *Journ. of Path. and Bact.*, 1909, vol. xiii, p. 62. [2] Graham and Poulton, *Quart. Journ. Med.*, 1912, vol. vi, p. 82

A STOCK VACCINE IN PNEUMONIA.

BY

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DURING two and a half months I had in my wards eighty-one cases of pneumonia. All were Indians, and almost all started as influenza, although such complications as malaria (M.T., B.T.), dysentery, and relapsing fever were present in addition to the pneumonia. All the cases were of the bronchopneumonic type; the sputum in practically all cases was excessive, purulent, and very often blood-stained, but not rusty. In over 90 per cent. of cases a Gram-positive strepto-diplococcus was the predominant organism; it was found also *post mortem* in the lungs. It was isolated by Captain J. D. Benjafield, R.A.M.C., and a vaccine was prepared from several strains, this vaccine being used as the stock vaccine in my treatment.

When I was using the vaccine for the first time I divided my cases, so that every third of those who had the strepto-diplococcus in the sputum was treated with the vaccine. Later, as I found the vaccine to be of value, every second case was treated with vaccine, and latterly every case of pneumonia which had had the streptococcus in the sputum received vaccine treatment; the sputum of every case of pneumonia was examined for the organism.

As regards other treatment, all cases have been treated similarly. All have been treated with a stock mixture consisting of potassium iodide, tincture of belladonna, and aromatic spirits of ammonia; as the cases occurred in a region where malaria is very common, even though that disease was not found to be present on the examination of two blood films at least, quinine was given daily. As the mouth was usually very dirty, and pyorrhoea alveolaris by no means uncommon, a thymol mouth-wash was given daily to every case. The usual stimulants and oxygen were given according to the circumstances of the case.

The dosage of the vaccine used as a standard was as follows, slight deviations being necessary according to the circumstances of the case; for instance, if a marked reaction followed one dose of vaccine the same dose was given when next the vaccine was due, and not the increased dose. The first dose consisted of five million of organisms injected subcutaneously; the second, given two days later, of ten million; the third, given three days after the second, consisted of fifteen million, and the fourth, given four days after the third, of twenty million. In every case when the temperature came down to normal the vaccine was stopped, but was given if any rise of temperature occurred again.

The statistics for the 81 cases seem to show that the stock vaccine is of great value:

1. Treated with vaccine (35 cases).

Cures	30
Deaths	5

Mortality, 14.3 per cent.

2. Not treated with vaccine (46 cases).

Cures	30
Deaths	16

Mortality, 34.8 per cent.

Among the five deaths in those treated with the vaccine three were complicated, one with malaria (B.T.), the second by acute bacillary dysentery, and the third was found at necropsy to have acute tuberculosis of the lung and pleura combined with tuberculous laryngitis as well as pneumonia. Only two of the deaths were uncomplicated, thus lowering the mortality in the uncomplicated cases to 5.7 per cent. In the cases not treated with vaccine six of the deaths occurred in cases complicated by other diseases, three being complicated by malaria (M.T.), two by malaria (B.T.), and one by a liver abscess, leaving a total of ten deaths from uncomplicated pneumonia, the mortality being decreased to 21.7 per cent. in such cases.

Four cases were treated with autogenous vaccines prepared by Captain Benjafield from the sputum of each case. All these cases seemed to be chronic, but all recovered, and a marked improvement was shown after the use of the autogenous vaccine

THE HEALTH RESORTS AND THE STATE.*

BY

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THE establishment of a Ministry of Health marks a new era in the history of the medical profession and demands the closest attention and criticism, with a view to co-operation of every practitioner, without which it must fail to achieve any substantial success. In addition to united effort to further the broader aims of medicine each special branch must seek to develop its opportunities for the welfare of the nation. Sir Bertrand Dawson, in his recent addresses on the future of the medical profession, has pointed out how great a field of usefulness exists for the health resorts in this direction, especially in the early and preventive treatment of many diseases which seem peculiar to the strenuous life of to-day. If this field is to be cultivated to its fullest extent it is essential that all practitioners in such resorts should combine to guide the development of such places, whether they be spas, seaside resorts, or simple climatic stations, and to bring their claims as the convalescent homes of the nation prominently before the notice of the public and the state. A Ministry of Health, whatever its initial programme, must develop in the direction of providing care and treatment for the sick—primarily the poor, but ultimately for the whole community so far as they may elect to take advantage of it. National sanatoriums for tuberculosis already exist; health resort treatment for the soldiers has been freely provided during the war, and its logical sequel in the provision of the same for pensioners has followed; nationalization of hospitals is in the air, and will, I have no doubt, soon become a fact, and state recognition and control of health resorts will follow sooner or later, and it ought to be in the hands of the medical profession to determine what form it shall take.

Of the total working time lost by the population through illness a very large proportion is due to chronic diseases of the rheumatic type which are capable of being effectively treated in our spas. If sent for treatment early they can be restored to usefulness, but if allowed to drift, as they often are, they become hopeless cripples, such as may be seen in numbers in the Poor Law hospitals. In no class of case is there a greater prospect of saving years of usefulness to the state by early treatment, and such cases ought to be able to obtain the best treatment directly they are diagnosed. But how can this be done so long as the only hospitals specializing in such work are dependent on charity, and bound to limit the stay of patients by the subscriber's letter of recommendation or some similar means of accommodating the supply to the demand? The hospital at which I have the honour to be a member of the staff possesses over 300 beds; I have known a waiting list of over 500 names, many of the unfortunate people losing time which must make all the difference to their chances of cure. All such institutions should be controlled by the state in such a manner that no other factor shall influence the stay of the patient than that of the maximum benefit having been secured. In urging this I am not advocating the claim of any particular mineral water or, indeed, of any special line of treatment, but simply that such cases should be brought together under conditions of the most favourable kind as regards climate and surroundings—in fact, in health resorts, where will necessarily be congregated practitioners of the greatest experience in the management of such diseases. The equipment available must be of every kind—balneological, electrical, dietetic, etc.—and full provision must be made for bacteriological and chemical research, and *x*-ray work.

Nor is it only for the rheumatic diseases that such provision must be made, nor for the poorer classes only. A large section of the middle classes, who work long hours in shop or office, often under unfavourable conditions, cannot afford the cost of a visit to the spa or the sea of sufficient duration to restore their mental and physical balance, or the loss of income entailed by absence from work, while their income and so-called social position exclude them from hospital treatment on charitable lines. Largely for such cases Sir Bertrand Dawson has suggested

*Shortened version of a paper read before the Section of Balneology and Climatology of the Royal Society of Medicine on March 6th.

the provision of sanatoriums in the neighbourhood of large towns where they might reside for a period under a proper regimen of diet, hydrotherapy, systematic games, etc., while at the same time continuing in some measure to attend to their business. He looks for the establishment of such sanatoriums to private munificence, but it is doubtful if more than a fraction of what is required could be provided in that way, and it is not right that we should look to private charity for the performance of a duty which belongs to the state. It is to the interest of the state that the fullest facilities for maintaining and regaining health should be brought within the reach of every one; and, applying this principle, it follows that some scheme must be evolved in our health resorts to bring their advantages within the reach of all.

Some form of state supervision is therefore inevitable sooner or later, and it ought to lie in our own hands to decide what form it shall take. It will have to be decided whether every resort should provide for every class of patient or whether it would be better that there should be selected places wherein by means of a state subsidy the cost of treatment would be so reduced as to be within the reach of all, or whether the establishment of state sanatoriums would be the better plan. The natural advantages of small places, which may be far greater than those of their more prosperous rivals, should be developed to their fullest extent for the common good, remembering that they are often more beneficial to the neurasthenic or the sufferer from the early manifestations of arteriosclerosis than the fashionable spa or seaside resort. The sanitary equipment of every place claiming to be a health resort must be made as perfect as possible, satisfactory water supplies secured, and natural amenities developed; but so long as these requirements have to be provided out of local rates they will be beyond the reach of small places, and even the larger towns will be administered as trading concerns, and the financial welfare of the municipality will come before provision for the welfare of the seeker after health. To meet this difficulty the imposition of a cure tax on Continental lines has been advocated, but the establishment of such an innovation might prove disastrous to the town which set the example, and to be equitable it should be collected by the state and distributed according to the need of the different resorts without regard to the proportion contributed by each.

The medical profession in every resort ought to organize itself for the purpose of team work, either as a whole or in groups of partners, so that every case might be dealt with as if in a modern and perfectly equipped hospital—the physician, the surgeon, the practitioners in special branches, the radiographer, and the pathological chemist each doing his share. The *malade imaginaire* would soon be eliminated, or perhaps be found to be the subject of some obscure pathological process which has hitherto escaped our ken, and great discoveries would, I am convinced, be made in the beginnings of chronic disease and in its treatment, with infinite benefit to the community.

State recognition of the value of health resort treatment must be accompanied also by the establishment of systematic instruction in physical methods of treatment—hydrotherapy, climatotherapy, electrical and mechanotherapeutic methods, and short courses of instruction might with advantage be arranged in the great mineral water hospitals. This would not only benefit those whose intention it might be to practise in the health resorts, but would extend the use of physical methods in home treatment and would enable the doctor to select the right climate, mineral water, or type of sanatorium which would be of most benefit to his patient.

Possibly to some these views will seem Utopian, but to establish Utopia in the matter of health must be the aim of our profession if we are true to it. Our duty to the state demands all our energies and the subordinating of personal ambitions and inclinations to the common cause.

At a recent meeting of the Belgian Academy of Medicine, Dr. De Moor, of Brussels, read a communication embodying the results of a study of the growth (weight and size) of 11,000 children attending the schools of the Belgian capital during the four years of the war. He found that there was an average retardation of nine to twelve months in their development. This result he attributed to the bad food and housing conditions.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

THE ETIOLOGY OF RICKETS.

The cause of rickets is still somewhat obscure. Still (*Osler's System of Medicine*, p. 776) considers the one determining cause to be faulty feeding or faulty assimilation. Rickets, he says, "is in fact a food disorder." Adami (*Principles of Pathology*, p. 1008) is inclined to regard the disease as a disorder of growth due to improper diet, overcrowding, and general unhygienic surroundings.

The contribution by Noël Paton, Findlay and Watson (British Medical Journal, 1918, vol. ii, p. 625) is welcome as throwing further light on the subject. Their observations appear to show that, in puppies at any rate, fresh air and exercise are more important than diet in averting the disease. In fresh air and exercise there are three factors—the actual air with its oxygen content, sunlight, and bodily exercise. In these observations several of the puppies which became rachitic were admittedly in a large airy room, and some of them apparently took quite a fair amount of exercise. Is it not, then, the third factor—sunlight—which is the determining element?

Experience in this country seems to support this conclusion. Nothing could be worse than the sanitation of the city of Srinagar. Filth diseases abound. The children are poorly fed. Hydrocarbons are deficient in their diet. Infants are often suckled for two or even three years. Poverty and squalor are universal. But rickets is extremely rare. In twenty thousand out-patients perhaps half a dozen cases may be seen. The overcrowding and unhygienic condition of Srinagar differs from that of large towns at home in the amount of sunlight. For nine months in the year the sun shines nearly all day. Even in the month of September the rays are so strong that a thermometer in sunshine will sometimes show a temperature of 130° F. When the sun shines, whether in winter or summer, the poor come out of their dirty close little rooms and work and sit about in the sunshine.

The only case of rickets I have seen here in an English child was in a large house, sufficiently airy, and under conditions where there was no lack of good nourishing food. But the house was gloomy. The light was obstructed by deep verandahs, and no sunshine ever penetrated the rooms. When the family moved to a new house with free access of sunshine the disease cleared up.

The essential point is that in the East, even where dwellings are insanitary and dark, the people live in the sunshine during the daytime.

There is one other point. Can rickets be an infective disease? This view has been put forth by Kassowitch and Morpurgo (*Centralbl. f. Path.*, xiii, 1902, p. 113). The experimental work on young rats with resulting rickets may, however, have been vitiated by operation of the same causes as those at work in the physiological laboratories of Glasgow. At the same time infection cannot be summarily excluded. It is possible that absence of sunlight is only a predisposing cause, just as waters rich in magnesian limestone salts do not produce goitre but predispose to the infection which causes it.

Kashmir. Ernest F. Neve.

APPENDICITIS COMPLICATED BY UMBILICAL HERNIA.

A private in the West African Regiment, about 30 years of age, was admitted to the Military Hospital, Tower Hill, Sierra Leone, complaining of pain in the right side; it had come on suddenly three days previously; he had not had a similar attack before. The temperature was 100° F., and the pulse 90. The bowels were regular; the tongue was slightly furred and moist; micturition was normal. He was very tender over the right iliac fossa, and the lower right rectus was distinctly rigid. Pain was most intense on deep pressure over McBurney's point. There had been no vomiting. A small reducible umbilical hernia was noted. This is very common in both sexes, and rarely gives rise to any trouble. A diagnosis of acute simple appendicitis was made. During the night the patient was very restless, and in the early morning complained of pain at the umbilicus. The hernial swelling was tense, and

tympanitic and could not be reduced. He stated that this had occurred once before.

A transverse elliptical incision was made round the umbilicus and the neck of the sac exposed and slit up. A loop of slightly congested ileum was reduced and a radical cure effected by overlapping the rectus sheath transversely, after closing the peritoneum with a purse-string suture.

The appendix was approached through a gridiron incision. It was found lying behind the caecum, to which it was bound by slight adhesions. It was about four inches long and acutely inflamed, the tip being nearly perforated. The adhesions were separated by gauze dissection and appendicectomy performed, the stump being carbolized and invaginated. The wound was closed in the usual manner, and the patient made an uninterrupted recovery.

The appendix was very oedematous, and there was a small patch of necrosis at the tip, through which a large stercolith escaped. The mucosa was acutely inflamed and showed numerous small haemorrhages.

Appendicitis is stated to be of very rare occurrence among the natives.

CYRIL H. CUFF, M.B., B.S.Dunelm., M.R.C.S.Eng.,
Lieut. R.A.M.C.

Reports of Societies.

POLYCYTHAEMIA.

AT a clinical meeting of the Medical Society of London held on April 14th, the President, Dr. A. F. VOELCKER, in the chair, amongst the cases shown were three with polycythaemia, in two of which it was symptomatic, whilst the third was an example of true splenomegalic polycythaemia.

In a case shown by Dr. J. WALTER CARR the patient was a man aged 22, who was suffering from dyspnoea and exhaustion on any exertion, and was subject to attacks of giddiness, loss of consciousness, and convulsive movements. Cyanosis and clubbing were present, the heart was a little enlarged to the right, but was otherwise normal. The red blood corpuscles numbered 8,200,000 per c.mm., the white corpuscles 7,200 per c.mm. The differential count was normal. Haemoglobin amounted to 136 per cent.; the colour index was 0.8. The blood pressure was equal to 120 mm. Hg. There was no enlargement of the liver or spleen. The urine was normal. Without enlargement of liver or spleen the case could hardly be regarded as one of idiopathic polycythaemia (Vaquez's disease), and the question arose as to whether it was a case of congenital heart disease without a murmur.

In the course of the discussion Dr. PARKES WEBER said that he thought it was probably a case of polycythaemia secondary to a large hole between the ventricles.

Dr. CARR also showed a case of congenital morbus cordis with polycythaemia in a girl aged 16. She had always suffered from breathlessness on exertion, and occasionally from attacks of precordial pain. She had had four attacks of rheumatic fever, but otherwise her health had been good. There was a loud rough systolic murmur accompanied by a well marked thrill in the pulmonary area, which was heard less loudly all over the precordium and in the back. The apex beat was in the fifth space in the nipple line, and the heart was slightly enlarged to the right. The blood pressure equalled 130 mm. Hg. The red blood corpuscles numbered 7,000,000 per c.mm., the white blood corpuscles 8,300 per c.mm.; the differential count was normal. The haemoglobin equalled 112 per cent., the colour index was 0.8. There was slight clubbing of the fingers and a little cyanosis.

The PRESIDENT pointed out that it was unusual that in this case, which on examination of the chest presented the features of pulmonary stenosis, there should be so little cyanosis and no definite clubbing.

Dr. F. S. LANGMEAD, while agreeing that in cases of pulmonary stenosis the most extreme degrees of cyanosis and clubbing were met with, said that he had often found a very loud murmur and considerable thrill in the pulmonary area in children who were quite free from symptoms of any kind.

The PRESIDENT showed a case of polycythaemia rubra with splenomegaly. The patient was a man aged 64. The family history was unimportant. The man had had pleurisy thirty years ago, but no other illness until twelve months ago, when he began to complain of pain across the abdomen and afterwards of pains in the back and in the veins of the legs. There was cyanosis of the ears, face, hands, and feet, and of the mucous membranes (conjunctivae, lips, mouth). The veins were turgid, but their walls not thickened. The spleen was enlarged, not tender, and reached for three fingerbreadths below the costal margin. There were no valvular lesions of the heart. A trace of albumin was present in the urine.

Blood Count: Red corpuscles, 11,320,000 per c.mm.; white corpuscles, 5,900 per c.mm.; haemoglobin, 120 per cent.

Differential Count: Polymorphs, 72 per cent.; lymphocytes, 22 per cent.; hyalines, 3 per cent.; eosinophil, 1 per cent.; basophil, 2 per cent.

The blood pressure equalled 135 mm. Hg.

Dr. EDMUND CAUTLEY showed a case of aortic aneurysm and (?) gumma in mediastinum, one of severe anaemia in a man aged 57 years, and a case of coeliac disease.

Lieut.-Colonel DONALD ARMOUR showed a case of cirsoid aneurysm in the palm of the hand.

ANAESTHESIA.

A CLINICAL evening of the Section of Anaesthetics of the Royal Society of Medicine was held on April 4th, the President, Dr. LL. POWELL, in the chair. Mr. ASHLEY DALY reported a case in which direct massage of the heart restored the circulation and respiration when both had ceased in the course of an abdominal operation upon a patient in a state of severe shock. The PRESIDENT quoted a case of successful heart massage during laparotomy upon a middle-aged man with rigid abdomen. Dr. F. E. SHIPWAY related a case in which in a feeble man of 60 collapse ensued upon withdrawing the stomach from the abdomen. Heart massage was successful in restoring the circulation.

Mr. R. E. APPERLY read notes of a case in which heart failure followed change of position. The patient was a stout woman anaesthetized with "gas and ether" and open ether, for laparotomy. When the Trendelenburg position was adopted pulse and breathing ceased. These were restored by artificial respiration and horizontal posture. The operation being nearly completed, the Trendelenburg position was tried again, when the same sequel of events resulted.

The PRESIDENT related a case in which "twilight sleep" and spinal analgesia were successfully employed for Caesarean section upon a woman suffering from influenza and double pneumonia.

Dr. F. E. SHIPWAY read notes showing the value of oil-ether anaesthesia in a case in which a physician had advised against operation on the ground that no anaesthetic could be tolerated. The patient had carcinoma of the stomach and had been the subject of aortic aneurysm for four years. He also related a case of enucleation of tonsil in a man weighing 24 st., whose build, huge abdomen, large pendulous cheeks and chin, and very short neck, made him appear a most unfavourable subject for anaesthesia. Operation was successfully performed under anaesthesia induced by C.E. mixture, and continued by warm chloroform and oxygen, bromide and morphine and atropine having been used as preliminaries.

Mr. H. E. G. BOYLE read notes of a case of laryngofissure with removal of intralaryngeal growth, performed under gas and oxygen. Morphine and atropine were used beforehand, and "gas and oxygen" was admitted through a catheter passed into the tracheotomy tube, the tracheotomy having been performed under gas and oxygen with rebreathing.

THE ENIGMA OF THE BIRD'S BRAIN.

AT the meeting of the Manchester Literary and Philosophical Society on March 18th Professor G. ELLIOT SMITH, M.A., M.D., F.R.S., read a paper entitled "The Bird's Brain." It had, he said, always been an enigma that, in spite of their very scanty equipment of obvious cerebral cortex, birds should display, in their powers of tactile, visual, and acoustic discrimination, their associative memory, and their ability to learn by individual experience,

outstanding evidence of functions such as are intimately associated in mammals with the activities of the cortex. The explanation of this apparent discrepancy between the morphology of the brain and the bird's aptitude to profit by experience was provided by the fact that a great part of the structure usually called "corpus striatum" was cortical in origin and in its fibre-connexions. The structures called by Edinger "hyperstriatum" (Kappers's "neostriatum") and "epistriatum" (Kappers's "archistriatum") were composed of modified cerebral cortex; and the former represented not only the neostriatum (nucleus caudatus and putamen) of the mammalian brain, but also the primordial neopallium or true cerebral cortex. The clue to the interpretation of these homologies was provided by the archaic reptilian brain that had survived in *Sphenodon*, in which was displayed with diagrammatic clearness the formation of a great cortical ingrowth into the lateral ventricle. The reason for this curious transformation was the expansion of the lateral edge of the pallium under the influence of a suddenly increased influx of sensory fibres (tactile, visual, and acoustic) from the thalamus. In virtue of the principle of neurobiotaxis (Kappers), this cortical overgrowth remained moored as near as possible to the incoming thalamic fibres; hence the development of the "dorsal ventricular ridge" (Johnston). In mammals the whole of the newly modified cortex did not become drawn into the ventricular ridge; part of it remained upon the surface, free to expand and develop into the neopallium; the rest became transformed into nucleus caudatus, putamen, and nucleus amygdalae. But in birds the whole mass became intraventricular, and represented not merely the neostriatum but also the rudimentary neopallium.

Reviews.

WAR NEUROSES.

THE treatment of the important group of cases classed as war neuroses has hitherto been mainly confined to a few selected officers in the R.A.M.C., but now that such cases are being dispersed in largely increasing numbers throughout the country it becomes necessary for all practitioners to have some knowledge of the best methods of diagnosis and treatment. Relapse of the apparently cured and care of those discharged to pension will give cause for anxious thought, and therefore Dr. MACCURDY'S simple and clear statement of the main conditions will be welcomed.[1] Bringing to the subject many years of experience in civil neurological work, and viewing the war problems from the standpoint of an observer in British military hospitals, he has arrived at certain definite conclusions which, if not altogether accepted by most war neurologists, are yet likely to prove helpful to those less experienced.

A true conception of war neuroses demands a study of psychology in warfare. This has not always been sufficiently recognized in the past, either by the medical profession or by the military authorities. For the latter, since warfare leads to an increasing strain on the human mechanism, such knowledge is essential. A careful study of the psychological results of aërial bombing, for instance, is likely to lead to more useful conclusions than a mere regard for the material results. So also knowledge of how to produce in the armed forces of the enemy the mental breaking strain, whether in individuals or in formations, and at the same time to protect his own troops, becomes to an army commander almost as important as the infliction or the prevention of physical injuries.

Dr. MacCurdy considers that war neuroses may be divided into two classes—the "anxiety states" and the "conversion hysterias." He regards them as being simple in origin—far more so than similar conditions in civil life, and as originating largely in the elementary instinct of self-preservation. In the "anxiety states" the more common causes are shown to be fatigue—whether physical or mental—and the strain of living constantly on the alert, associated, in officers especially, with a sense of great responsibility. This produces disturbed sleep, and a vicious circle is set up, leading ultimately to a desire for death as an end to the misery, and the final collapse, which may be ushered in by a stuporous condition. The author considers that disturbance of the endocrinic functions has not been proved to play a very important part. He also regards an intensive bombardment as being a prominent factor in the causation of these mental states. Both these views may be questioned. The slow, intermittent bombardment at uncertain intervals is by some regarded as more trying than the short hurricane of shells. The mental struggle of the man who feels himself beginning to break, and who makes conscious efforts to conceal his condition, and to avoid the appearance of cowardice, living meanwhile a life of mental martyrdom, is well portrayed. Perhaps one day we shall have an account written by a neurologist or a psychologist of his own condition, if such a one has had the necessary personal experience. As might be expected, officers suffer more in proportion than men from these "anxiety states." The treatment may be summarized as immediate rest, the avoidance of drugs, progressive work, and the intelligent individual sympathy of the doctor with his patient.

"Conversion hysteria" is defined as a neurosis in which there is an alteration or dissociation of consciousness regarding some physical function; for example, mutism, paralysis, or anaesthesia. It occurs more frequently in soldiers than in officers, and is often implanted on some physical trauma. Here again self-protective individualism plays its part, for such a manifestation will naturally protect the individual from further fighting. For these conditions re-education is advocated as the best treatment, to the exclusion of electricity and hypnotism.

The argument of the book is supported by many illustrative cases, and the author has given a simple but eminently helpful outline of this complex subject.

[1] *War Neuroses.* By John T. MacCurdy, M.D.; with a preface by W. H. R. Rivers, M.D. Cambridge University Press. (Pp. ix + 132. 7s. 6d.)

SYPHILIS AND PUBLIC HEALTH.

AT the present time, when the air is full of reconstruction and the attitude of the lay and professional mind is that of expectancy as to changes in the way in which syphilis should be regarded and dealt with, an impartial survey of the data as to prevalence, sources of infection, personal prophylaxis, and public health measures against this disease is of great value. Lieut.-Colonel E. B. VEDDER'S book on *Syphilis and Public Health*,[2] published by permission of the Surgeon-General of the United States Army, admirably meets this want. The author has had exceptional opportunities of studying the subject in the United States army, having had a long term of service both in the field and in garrisons, followed by four years of laboratory work. The error in his method of carrying out the Wassermann reaction, which is described in the appendix, works out at 1 per cent.

The first hundred pages are devoted to a statistical account of the prevalence of the disease, about half the space being occupied by details about the United States, where the importance of the disease as a disposing factor to pulmonary tuberculosis is shown by the presence of syphilis in 20 to 30 per cent. of the ordinary class of consumptives in the sanatoriums. In speaking of the spread of the disease in remote parts of the world he epigrammatically remarks that probably whole races become thoroughly syphilized much faster than they become civilized.

On the basis of numerous statistics a strong case is made out for prophylaxis both before and immediately after coitus, and in meeting the objection to prophylaxis—that venereal disease is God's punishment for immorality and that the fear of disease deters many from vice—he insists that the punishment falls on innocent wives and children, and is therefore not a just punishment such as a just God would devise; and that the idea that the fear of disease acts as a deterrent to immorality is a very widespread delusion, for young men fear little; this is not due to ignorance, as medical students are not more moral than other students. He, however, insists that satisfactory results from prophylactic measures can only be expected among bodies of men under strict discipline, military or otherwise. He concludes that notification, although desirable, cannot be effective until ample facilities for treatment

[2] *Syphilis and Public Health.* By Edward B. Vedder, A.M., M.D., Lieutenant-Colonel, Medical Corps, United States army. Philadelphia and New York: Lea and Febiger. 1918. (Pp. 315. 2.25 dols.)

are provided, and gives a detailed summary of the requirements for the control of syphilis by a community. Though largely based on the conditions in the United States this work should be read by any one in this country seriously interested in the problem of venereal disease.

CONSCIENCE AND FANATICISM.

IT is a far cry to the thirteenth century Ayenbite of Inwit, wherein the first English writer on this theme essayed to expound his subject in 10,000 lines. To the formidable mass of literature that has grown up on this foundation during the passage of seven hundred years Mr. G. PITT-RIVERS has now added a volume entitled *Conscience and Fanaticism: An Essay on Moral Values.*[3] When conscription became law the subject entered a new phase and has taken a place in public general discussion such as it never had before.

The "conscience" in matters of religion has always been recognized and accepted, but the conscience which forbids a man to make a road for an army or to infuse a cup of tea for a soldier, or even to hand a bandage to a wounded combatant, is something entirely novel. But there it is, and even the law has given public acknowledgement of its existence and provided safeguards against its being outraged. The time is, therefore, opportune for a discussion of what conscience really is, and as to the sphere within which its dictates should be regarded as inviolable. Mr. Pitt-Rivers's contribution to the subject puts aside all religious sanctions and frankly bases "conscience" upon utilitarian grounds. The utility may not be very clear to the individual, but it comes down to him by inheritance from ancestors who experienced it. This instinct, or hereditary influence, in a particular life will be modified by various factors—Emotion, Judgement of Ends, Environment, and Cosmic Suggestion. The last of these is the author's explanation of the psychology of the crowd. In the exposition of this thesis many subjects are touched upon—subliminal consciousness, faith healing, hypnotism, symbolism, auto-suggestion. As the press is described by the author as an organized concern for the dissemination of lies and counter lies and the propagation of hate, envy, and humbug, we have some hesitation in giving any opinion as to his work. This we may say, however, that the links of the argument are not always very evident, and that the explanation of conscience seems to consist in explaining it away altogether.

JOHNSTONE'S "MIDWIFERY."

THE second edition of *A Textbook of Midwifery*,[4] by Dr. R. W. JOHNSTONE, has appeared from the Edinburgh Medical Press Series, and, without presenting any very unusual features, it has substantiated its claim to place before the student and practitioner a concise presentment of midwifery. The new edition contains additional matter which deals with the most recent topics of midwifery and gives the author's views on them. They are a little disappointing and are not dealt with in any great detail, but this will doubtless be remedied as knowledge of these subjects accumulates and becomes more definite. Apart from this, the subject matter is clearly handled, and a very commendable feature of the book is the simplicity and brevity of the language in which the main outlines are laid down. This is especially true of the chapter on embryology, for, although there is a difference on certain points from the usually accepted teaching, the author gives a clear account of his own view of the subject and does not allow himself to wander from the main issue to detail at length what other people think and so confuse the mind of the reader. The illustrations are skilfully drawn and include a considerable number from other textbooks on the same subject. These enhance the value of a very serviceable volume, which can be recommended to students and practitioners of midwifery.

[3] *Conscience and Fanaticism: An Essay on Moral Values.* By George Pitt-Rivers. London: Wm. Heinemann. 1919. (Demy 8vo, pp. xvi + 112. 6s. net.)

[4] *A Textbook of Midwifery.* For Students and Practitioners. By R. W. Johnstone, M.A., M.D., F.R.C.S., M.R.C.P.E. Second edition. London: A. and C. Black, Ltd. 1918. (Cr. 8vo, pp. xxvi + 495; 264 figures. 12s. 6d. net.)

NOTES ON BOOKS.

SIR HENRY MORRIS'S introductory address to the meeting of the medical profession held in the Steinway Hall, London, on October 1st, 1918, was reported in the JOURNAL of the same week. He has since published it in a pamphlet,[5] together with additional remarks on the need of medical representation in Parliament.

IN a pamphlet coming to us from Buenos Aires Drs. CASTEX and MATHIS uphold the simple theory that ulcers of the stomach and duodenum are exclusively syphilitic in origin.[6] The infection is to be regarded as congenital in nine-tenths of the patients developing such ulcers before the age of 30, and as acquired in nine-tenths of those suffering from them after that age, the remaining tenth of the cases being due to the acquired or the congenital forms of syphilis respectively. The authors argue that the treatment of gastric and duodenal ulcer must be antisyphilitic if it is to be curative; treatment on dietetic lines they describe as palliative only. They record a number of cases illustrating their point of view. The essay suggests that the etiology of these ulcers is not the same in the Argentine as it is in this country.

Volumes 32 and 33 of the *Transactions of the American Climatological Association*, for the years 1916 and 1917, contain a number of papers that should interest general practitioners of medicine in America as well as specialists in balneology and climatology all the world over; to a large extent these papers deal with the general aspects of diseases of the lungs or heart.

[5] *Medical Men in Parliament.* An address delivered by Sir Henry Morris, Bt. London: Harrison and Sons. 1918. Price 6d.

[6] *Sífilis hereditaria tardia. La Ulcera Gastrica y Duodenal.* By Mariano R. Castex and Adolfo Mathis. Buenos Aires: A. Guidi Buffarini. 1918. (Roy. 8vo, pp. 44.)

ROYAL MEDICAL BENEVOLENT FUND.

AT the meeting of the Committee on April 8th, 1919, thirty cases were considered and £305 voted to twenty-five of the applicants. The following is a summary of some of the cases relieved:

Daughter, aged 74, of M.D.Lond. who died in 1877. Only certain income £56 12s. per annum from investments, etc. Voted £12 in twelve instalments.

Widow, aged 66, of L.S.A.Lond. who died in 1913. Was left unprovided for. Has army allowance from son, who is a private. One daughter married, and unable to help. Pays 12s. 6d. a week rent. Voted £2, and referred to the Guild.

M.R.C.S.Eng., aged 82, widower, who has a pension of £100 a year, but lost other income through death of wife, who had an annuity. Suffers from ill health. Relatives are temporarily paying the rent, which is £38 per annum. One daughter, aged 44, who was formerly a governess, but is now at home looking after her father. Voted £26 in twelve instalments.

Daughter, aged 58, of M.R.C.S.Eng. who died in 1898. Receives a pension of 6s. per week from an assurance company where she used to work. Pays 3s. a week rent for one room. Relieved four times, £53. Voted £15 in twelve instalments.

Daughter, aged 50, of M.D.Glasg. who died in 1872. Earns £1 per week by clerical work and takes in paying guests when possible. Lives in own house. Pays £8 a year for rates. She finds it difficult to manage owing to the high cost of living. Relieved four times, £40. Voted £10 in two instalments.

Widow, aged 50, of M.B.Edin. who died in 1912. Was left totally unprovided for, with seven children, the two youngest still at school. Receives £22 from other charities and £65 from children. Relieved seven times, £132. Voted £20 in twelve instalments.

Widow, aged 64, of L.R.C.P.Irel. who died in 1916, and was an annuitant of the Fund and other charities. Applicant was left without means. Has £30 from another charity and £15 from friends. Rent and rates, £48. Relieved three times, £29. Voted £15 in twelve instalments.

Widow, aged 43, of L.R.C.P.Edin. who died in 1917. Applicant's husband died unexpectedly, and left her with two children, now aged 15 and 11. Only income £70 from dividends. Rent and rates £20. Relieved once, £10. Voted £15.

Subscriptions may be sent to the Acting Honorary Treasurer, Dr. Samuel West, at 11, Chandos Street, Cavendish Square, London, W.1.

The Royal Medical Benevolent Fund Guild is now called upon, as a result of the war, to deal with many widows and children who, in happier times, would not have thought of asking for assistance. It is glad to receive secondhand clothing and household linen. The class of clothes most wanted is that suitable for boys and girls working in offices, for women, and for old men. The gifts should be sent to the secretary of the Guild, 43, Bolsover Street, W.1.

British Medical Journal.

SATURDAY, APRIL 26TH, 1919.

SIR CLIFFORD ALLBUTT'S PORTRAIT.

The Council of the British Medical Association has asked the President, Sir Clifford Allbutt, K.C.B., F.R.S., to accept a portrait of himself as a gift from members of the medical profession, and he has consented to give sittings for the purpose to an artist of eminence. Sir Clifford Allbutt has been President of the Association since August, 1914, and has on many occasions shown the deep interest he takes in its work. Age sits lightly upon him; he took an active part in the recent most successful Special Clinical and Scientific Meeting in London, and will be in the chair at the annual meeting to be held at Cambridge in 1920. Sir Clifford Allbutt has been Regius Professor of Physic in the University of Cambridge since 1892. So great is the respect, and, if we may be permitted to say, the affection, in which he is held by all ranks of our profession, that very many will without doubt wish to join in this presentation to him. It has accordingly been decided to limit the amount of individual subscriptions to one guinea. The Treasurer of the British Medical Association is now prepared to receive subscriptions of this or lesser amount from any member of the profession. Cheques should be made payable to the "Sir Clifford Allbutt Presentation Fund," and crossed London County, Westminster, and Parr's Bank.

THE PROFESSIONAL WAR COMMITTEES.

To Scotland we owe the origin of the first of the professional war committees. To the Metropolitan Counties Branch Council of the British Medical Association is due the credit for laying the foundations of the Central Medical War Committee. From the Central Medical War Committee arose the suggestion for the formation of the Committee of Reference. To the National Insurance Commissioners the three Committees were indebted for their recognition as statutory bodies. From Mr. Winston Churchill, a politician in a hurry, the professional committees received their *coup de grâce*. Such is the history, in brief, of the movement whereby throughout the war the policy of retaining in medical hands the management of medical affairs was maintained. It may be of interest to give a fuller account of the work undertaken by these committees, and the part played by the Association in their work.

Within a few weeks of the declaration of war the first step was taken by the Scottish Committee of the Association at the instance of its chairman, the late Dr. Hamilton of Hawick, and the Scottish Medical Service Emergency Committee was formed, consisting of representatives of Scottish universities and medical corporations, and of the British Medical Association. It was in January, 1915, that the first definite step was taken in England: two members of the Metropolitan Counties Branch then proposed at the Council meeting of the Association that a special committee of the British Medical Association should be formed to deal with war questions. The Council, however, considered it better to await the meeting of the Representative Body, and in the meanwhile referred the questions that were arising to the existing Committee of Chairmen of the Standing Committees of the Association.

In April the Metropolitan Counties Branch Council, finding many urgent matters to deal with, set up a War Committee of its own; an office was provided for it in the Common Room of the Association, and it began to make a list of all medical practitioners within the metropolitan area. This experiment after two or three months made it plain that the matter could not be dealt with by areas acting independently, and that the work begun by the Metropolitan Counties Branch must be extended to the whole of England and Wales. The Central Medical War Committee was accordingly constituted at the Annual Representative Meeting in July, 1915. The representatives of the Association were the four *ex officio* members; four members elected by the Council; four members elected by the Representative Meeting from among its own body; and four other persons also chosen by the Representative Body—namely, Sir William Osler, Sir T. Clifford Allbutt, Dr. A. E. Shipley, Master of Christ's College, Cambridge, and Dr. T. Jenner Verrall. Six other members representing the universities, colleges, and other medical bodies were co-opted, and later the number of members was increased to thirty.

The terms of reference of the Committee were "to organize the medical profession in such a way as will enable the Government to use every medical practitioner fit to serve the country in such a manner as to turn his qualifications to the best possible use, and to deal with all matters affecting the medical profession arising in connexion with the war." In October, 1915, the Insurance Commissioners became alive to the fact that the increase of the army and the imminence of conscription might necessitate closer organization of the medical profession if the panel service was to be maintained. Accordingly they approached the Central Medical War Committee, which was then engaged in compiling an annotated list of the whole of the medical profession in England and Wales, with a view to co-operation. From this it resulted that throughout its existence the meetings of the Committee were attended by representatives of the Insurance Commission, the Local Government Board, and other Government departments. This co-operation was of the highest value to the Committee; first because the Insurance Commission, and later the Ministry of National Service, supplied a great deal of indispensable clerical assistance; and secondly, because it was through the Insurance Commissioners that the three committees became recognized as statutory professional committees when the Military Service Acts were passed. Thus the committees, which at their origin were of the nature of advisory committees to the Director-General A.M.S., on matters affecting the relation between the medical demands of the army and the medical requirements of the civil population, subsequently became active recruiting agencies to obtain medical officers for the R.A.M.C., while retaining sufficient independence to criticize from time to time the demands and methods of the War Office authorities.

The work undertaken by the Central Medical War Committee was wide and varied. In addition to the task of preparing the list of the medical profession, showing ages and conditions of practice, a scheme of enrolment was devised while service in the forces was still voluntary, and a system of local war committees

representative of the whole medical profession was set up throughout the country. Difficulties in connexion with the selection of members of the staffs of London hospitals led to representations being made to the two Royal Colleges, and these representations resulted in the formation of the Committee of Reference. An Irish Medical War Committee was also established. Under the Military Service Act of 1916 it was provided that if a medical man of military age produced a certificate of enrolment, the recruiting authority would refrain from further action, and it recognized the committees as professional committees "to deal with claims for exemption made in respect of duly qualified practitioners, the decision of such committees to be binding on tribunals." This recognition involved laborious investigation of the medical conditions of every district and frequent and prolonged meetings of the Committee for the hearing of appeals against military service. It was during this work that the War Office made the unfortunate mistake of calling up for military service, in April, 1917, all medical men under 41. The combined protest of the Central Medical War Committee and the Committee of Reference led to a rapid abandonment of this ill-considered proposal and the tender of suitable apologies by the military authorities.

Other noteworthy pieces of work undertaken by the Central Medical War Committee were the organization of National Service Medical Boards throughout England and Wales at extremely short notice; the nomination of members for Neurasthenia Boards; the preparation, in collaboration with the Committee of Reference, of a scheme for dealing with dischargeable soldiers; the investigation of methods for carrying on central surgeries; the consideration of what was called "mobilization of the whole profession," which led to the drafting of a scheme of substitute medical service for submission to the Ministry of National Service; the criticism of certain orders of the Food Controller as to rations for invalids; and the preparation of a scheme for the release of medical officers from the forces. With regard to central surgeries and substitution service, it so happened that the armistice came in time to prevent the trial of either of these experiments on a large scale. That the supply of doctors for the civil population had reached a dangerously low level was shown by the second wave of the influenza epidemic at the close of 1918. If hostilities had continued it would probably have been impossible to avoid something like mobilization of the whole profession, unless a method had been found to force upon the War Office a more economical use—or at least co-operation with the civil profession in the use—of medical officers in the army.

In the last months of its career the Central Medical War Committee prepared for the Ministry of National Service a scheme for the demobilization of medical officers. The fairness of this scheme was almost universally recognized by the civilians to whom it was to apply. It was adopted by the Ministry of National Service and was in process of application. Unfortunately, however, it could not be made to work rapidly enough in the early stages; and for this various causes may be surmised. Thus, excellent as the scheme was, it was perhaps a little above the comprehension of plain men serving too far away for personal instruction. Again, any scheme of orderly release was handicapped by the fact that applications for demobilization could be made through a dozen channels instead of one, as was the case in matters of mobilization. The slowness of the procedure resulted in questions in the House of Commons. An impulsive politician, without consultation with those acquainted with the subject, sent an imperious demand for the release of an absurd number of doctors in a totally inadequate space of time. The whole machinery built up by the Central Medical War Committee was thus thrown aside, and for practical purposes the professional war committees ceased to exist.

The basis on which the professional war committees were built up was, as has been said, the wise policy of keeping in medical hands the management of medical affairs through every turn of the wheel of war. To the Association in Scotland great credit is due for its early grasp of this principle, and for the decision to make its war committee representative at once of the whole Scottish profession. The parent Association, when the need for the work became clear, placed its resources in money and organization freely at the disposal of a national committee for the whole profession of England and Wales. The work was often of an invidious nature, and might easily have been dangerous to the prestige of the Association with its members. The fact that it was undertaken as a patriotic duty, and was carried out successfully for so long a period, entitles the British Medical Association to the eternal respect of the medical profession.

ANTIRABIC TREATMENT IN LONDON.

In consequence of the appearance of rabies in dogs in the neighbourhood of London, and of the fact that three or four persons have been bitten by a dog definitely ascertained to be rabid, a new arrangement has been made by the Local Government Board which will enable antirabic treatment to be given in London as well as in Plymouth. The treatment will be given at the Pathological Department of St. Thomas's Hospital by Dr. L. S. Dudgeon, C.M.G., who has been supplied with antirabic material prepared at the Pasteur Institute in Paris and sent over at frequent intervals. This consists of dried cords of different ages preserved in glycerin and kept in the cold, from which the necessary emulsions are made as required. The normal course of treatment involves daily attendance for a fortnight. There is, of course, no necessity for the persons undergoing treatment to stay in the hospital. In order, on the one hand, that antirabic treatment should be offered to and urged on those who have been exposed to risk, and, on the other hand, to avoid applications for treatment for which there is no occasion, a regular system of interchange of information has been established between the medical officers of the Local Government Board, the Department concerned with the provision of antirabic treatment, and the Board of Agriculture, which is responsible for dealing with all questions relating to rabies in the dog. Persons bitten by suspected dogs should inform the police, through whom the necessary inquiries will be made in regard to the animal. The medical officer of health of the district will be informed in due course through the Local Government Board if the veterinary officers advise that the dog is proved to be rabid or if the symptoms in the dog are sufficiently suspicious to justify antirabic treatment before the confirmatory diagnosis is available. It is part of the system that the inspectors of the Board of Agriculture and the police authorities at once bring to the notice of the medical officer of health any suspicious case of dog bite reported to them. The medical officer of health, who then communicates with the Local Government Board on the case, is asked to obtain and supply the following particulars: (*a*) Name, age, and address of the person bitten. (*b*) Date when bitten. (*c*) Severity of the bite and part of the body bitten. (*d*) Name and address of owner of the dog, or other information which will enable the dog to be identified. (*e*) Whether rabies in the dog has been

diagnosed locally. When this information and the veterinary evidence show that the dog was rabid and that there has been a definite wound or abrasion of the skin which may have been infected, the case will be one for antirabic treatment. The medical officer of health will be informed of the facts, and all arrangements for the attendance of cases at St. Thomas's Hospital must be made through him. As previously announced, local authorities are empowered to pay expenses in necessary cases.

AN INDIAN PASTEUR INSTITUTE.

IN the report for 1917 of the Pasteur Institute, Kasauli (India), the director, Major A. G. McKendrick, M.B., I.M.S., states that the Indian patients numbered 4,824 and the European 382, a total of 5,206, which was 154 below the number of the previous year. The decrease is attributed mainly to the opening of the new Pasteur Institute at Shillong, which greatly reduced the number of patients going to Kasauli from Bengal and Assam. The number of cases from the British and Indian armies was 724, a marked increase; 311 of them came from Mesopotamia. In the case of 405 persons who applied, treatment was not considered necessary or was discontinued on receipt of information that the biting animal had not succumbed from rabies. Of those who received treatment 68, including two Europeans, contracted the disease. Of these, 9 died during the course of the treatment, which lasts fourteen days, 15 within fifteen days after discharge, and 44 more than fifteen days after discharge. The failure rate was 0.85 per cent., as compared with 0.80 per cent. for the previous year. The total death-rate for all patients was 1.31 per cent. Among Indians it was 1.37 per cent., a rate almost identical with that for the quinquennial period ending 1916. An analysis of 1,771 cases from areas definitely rural in character showed that the proportion of jackal to dog bites was 29.1 per cent.; the mortalities for dog and jackal bites were respectively 1.11 and 2.02 per cent. An analysis is being made of upwards of 6,000 cases to ascertain whether the difference noted above is due to the saliva of the jackal being peculiarly virulent, or whether, as is considered more likely, this apparent greater virulence is a secondary effect, dependent upon multiplicity of bites, their depth, position, etc. In addition to inoculations for rabies, the Institute, which is the provincial laboratory for the Punjab, made a number of examinations for the diagnosis of the enteric fevers, Malta fever, syphilis, malaria, and tubercle. Over 600 doses of vaccines and autogenous vaccines were sent out.

THE INTER-ALLIED RED CROSS CONFERENCE.

AN inter-allied conference of representatives of national Red Cross societies was held at Cannes during the first fortnight of the present month. Delegates were present from France, Great Britain, Italy, the United States, and Japan. The conference formed the first step towards the drawing up of a wide programme of Red Cross work, in the interest of mankind in general under peace conditions. The opening discussions were concerned with the desirability of proceeding at once with the immediate organization of an international council and bureau of hygiene and public health, to act as a link between the national Red Cross societies. This central health bureau, as outlined, would be concerned with schemes for child welfare and for the prevention of tuberculosis, venereal disease, and epidemic disease generally. After full discussion the conference formally gave its support to the proposal of the Committee of Red Cross Societies, that a central organization should be set up to stimulate and co-ordinate the voluntary efforts of all nations, through their respective Red Cross societies, for the promotion of sound measures for public health. In the report of the section of tuberculosis the signatories express the opinion that the following factors are fundamental in any organized campaign: (1) Dispensaries on an adequate scale, furnished with laboratories and proper equipment, and facilities for early diagnosis, and with specially trained nurses to carry into the patient's home the necessary care, instruction, and advice; (2) systematic inspection of school children; (3) adequate hospital treatment for advanced and acute cases; (4) sanatorium facilities for all suitable cases; (5) popular education. The report recommends the encouragement of all efforts for the improvement of the standard of general living and of working conditions of the people. The sub-committee on venereal diseases in its report lays down that any comprehensive scheme for combating these diseases must embody measures for the protection of individuals not yet affected; the elimination of environmental conditions favouring the spread of venereal disease; the discovery, treatment, and control of persons already infected; and the education of medical practitioners, nurses, and attendants. The malaria subcommittee's report deals with international control of this disease, and recommends that the proposed international health bureau should keep in touch with the progress of malaria control in each country for the stimulation and guidance of all. It was originally proposed that the general programme drafted by the delegates should be submitted to a further conference of all the Red Cross societies, to be held at Geneva thirty days after the declaration of peace; but it is understood that this conference has been postponed indefinitely.

PITUITARY HEADACHES.

THE severe headache of frank acromegaly is familiar, but perhaps more interest attaches to the early and less easily recognized manifestations of pituitary disorder before there are any permanent structural changes in the gland. The etiology of headache is so multifarious as to be sometimes baffling, and accordingly an article on pituitary headaches and their cure, by Pardee,[1] is of practical use. This headache is frontal, deep behind the eyes, and the patient may indicate its position by placing a finger on each temple and pointing inwards towards the hypophysis. It resists ordinary treatment, is accompanied by so much fatigue that the victim can hardly drag himself or herself about, lasts from half an hour to two days, is commoner in women than in men, may coincide with menstruation, and pass off very suddenly. The skin on stroking shows a broad white line due to adrenal insufficiency, which is ascribed to the drain on adrenal function by the exhausted pituitary; and at the climax of the attack there may be nausea and vomiting. As the pituitary and the adrenals control the mobilization of sugar the subjects of these headaches not unnaturally show anomalies of sugar metabolism and periodically have an intense craving for sweets, the satisfaction of which is almost invariably followed by a characteristic headache. The patients show signs of dyspituitarism, such as coarse hair with male distribution on the female, and vice versa, the eyebrows heavy and tending to meet, and in the female a moustache. The headaches are due to enlargement of the gland either from physiological or pathological causes, such as adenoma. The enlargement may be cyclical and connected with menstruation, compensatory to disease of the other ductless glands, or due to mental or traumatic shock. Skiagraphically the sella turcica may show various abnormalities, contraction or enlargement with apposition of the clinoid processes, or erosion of the clinoid processes. The administration of the whole pituitary gland cures these headaches and the accompanying symptoms in a large percentage of the cases, provided there is no progressive new growth of the pituitary body.

[1] I. H. Pardee, *Arch. Int. Med.*, Chicago, 1919, xxiii, 174.

THE SECTIONS AT THE CLINICAL AND SCIENTIFIC MEETING.

IN our issues of April 5th and 12th short notes were given of the discussions in the Sections of Medicine and of Preventive Medicine and Pathology; the first day's discussion in the Section of Surgery, on gunshot wounds of the chest, was briefly reported on April 12th, p. 457. We bring to a close these short and necessarily incomplete accounts of the morning sessions by printing below reports of Thursday's and Friday's discussions in the Section of Surgery. The opening addresses on each day in each of the sections had been printed beforehand and circulated to those intending to take part in the discussions, and were published in the Handbook of the Meeting. They will be included in the full "Proceedings," which will be published later in a separate volume and forwarded to every one attending the meeting whose address is known, and to all members of the Association. We also complete this week our account of the afternoon demonstrations which formed so valuable a feature of the meeting.

WOUND SHOCK.

A discussion on shock was held in the Section of Surgery on April 10th, with Sir Anthony Bowlby in the chair.

Professor W. M. Bayliss, in opening the subject, said that several causes entered into the production of shock, such as haemorrhage, toxic products from injured tissues, cold, and fatigue, with the consequence that there was a deficiency of blood in the circulation, usually shown by a fall of blood pressure. The blood was held up in the tissues and diminished by loss of plasma through the capillary walls, which had become abnormally permeable owing to defective blood supply. Whatever fluid was used for intravenous injection it ought to be one that did not leave the blood vessels. It had become evident that the really vital matter in the treatment of wound shock was to keep up the blood volume, for a deficient blood volume was more serious than decrease in the oxygen-carrying capacity of the blood. Gum saline seemed to fulfil all the requisites; and though it would seem natural that if the tissues had suffered from want of oxygen for any length of time recovery would be more probable from blood than from gum, yet several medical officers had shown that in the later stages no case that failed to respond to gum was found to respond to blood. Gum saline was thought to be more appropriate to cases of shock without haemorrhage because what was wanted was more fluid, the haemoglobin being already in the body. Sometimes a first injection had comparatively little effect, while a second was followed by rapid improvement. Cases of prolonged and serious shock failed to respond to both gum saline and blood, for there had been induced a paralysis of vital nerve centres, especially of the vasomotor centres, and an increase in the permeability of the blood vessels to colloids. There was very little positive evidence that blood transfusion was superior to gum transfusion.

Dr. H. H. Dale, in his opening remarks, held that secondary wound shock was essentially an oligaemia. It had been shown by the use of the "vital red" method that the volume of blood in effective circulation was seriously reduced. It did not accumulate in the great veins of the abdomen, nor was there marked arterial dilatation. The loss of plasma did not account for the whole of the deficiency, and by a process of exclusion they concluded that the missing blood was stagnating at the periphery instead of returning normally to the heart. This was due to a loss of tone of the capillary walls. All the features characteristic of shock could be produced by chemical agencies. He had found that the injection of a few milligrams of histamine into anaesthetized animals had this effect. This substance typified the action of a large class of cleavage products of protein—products of partial digestion, of autolysis, and of bacterial action. The absorption of products from injured tissues, especially muscle, apart from bacterial action, as causative factors of shock, had been emphasized by medical officers in France. They arrived at the conception of an aseptic traumatic toxaemia as playing a large part in the genesis of secondary wound shock. It had been found experimentally that the unanaesthetized animal could withstand much greater quantities of histamine than one under the influence of ether, though approximately the same as one anaesthetized with gas and oxygen. Anaesthetists on active service had identical experiences in shock cases. He concluded that the traumatic toxaemia could be coped with when the resisting powers of the healthy individual were unimpaired, but these might be depressed by cold, lack of fluids, haemorrhage, anaesthetics such as ether and chloroform, and probably pain and exhaustion; and in treatment one ought to remove the toxic focus as soon as possible, and to eliminate these accessory factors.

Following the introductory papers there was a keen discussion. Sir Anthony Bowlby spoke of the advances in the treatment of surgical shock during the war. From the very first they found that rest, warmth, drinks, and saline infusions were of value, and often the first two alone were sufficient. The second year witnessed a considerable diminution of fatalities from shock in fracture cases by the early application of splints in the forward areas. In the beginning of the third year they used sodium bicarbonate solution in addition to saline, with the consequence that they prevented sickness and allowed the patient earlier to partake of food. In 1917, thanks to the advocacy of our American colleagues, blood transfusions were instituted, and following that gum solutions were introduced. The latter were certainly more accessible at all times, but every one wished to know if it was as good as blood. Surgeons agreed with the physiologists that in shock there was a diminution of blood volume, and agreed that fluids should be given, but was there not too great a tendency to give fluids by every other channel than the natural one? There were great advances in the administration of anaesthetics and their use in combating shock, and he attached considerable importance to this part of the question. Dr. Geoffrey Marshall said that before the war the effect of anaesthetics in the production of shock was recognized. For example, under the general anaesthetics commonly used, when resection of gut was performed on children with intussusception, very few cases recovered, but when spinal anaesthesia was introduced the number of recoveries was much increased. Working at first at the base, he found that in operations on the thigh where there had been previous loss of blood the mortality was very high when chloroform was used. Ether was rather better than spinal anaesthesia, but the results of all three were poor in comparison with those obtained when they adopted gas and oxygen—a method of which he had a large experience in forward areas. Taking amputations of the thigh as a typical example, they found that shock was practically abolished, the blood pressure did not fall appreciably during the operation, and the number of deaths from shock was extremely small. It had a further advantage, in that it enabled patients to have a good meal soon after operation. In many abdominal operations the particular anaesthetic employed was not of such importance, but in very grave cases the use of gas and oxygen gave the chance of successfully operating, and even almost pulseless cases were saved. In civil life, owing to the want of muscular relaxation, this

method of anaesthesia failed in abdominal surgery. Captain Eric Taylor pleaded for intimate co-operation between surgeon and anaesthetist. The latter, by close attention to the blood pressure, could indicate to the surgeon the onset of shock. He did not agree that there was no fall of pressure with gas and oxygen, for the loss of blood would occasion it, but he did agree that there was no secondary or delayed collapse from its use. Further, the patient was enabled to take fluids soon afterwards—a point of great importance. With gas and oxygen also they preserved an intact vasomotor system.

Colonel H. M. W. Gray remarked that the use of morphine had been condemned on theoretical and clinical grounds, but he thought the effects depended on the way it was used. If the patient were moved immediately after having morphine the good effect was largely annulled; he ought to be left lying until the effect was produced. The dose was also important; at least a quarter or even half a grain should be given. The loss of quite a small quantity of blood was sufficient to produce shock. In treatment he considered that blood transfusion was preferable to gum transfusions, for he could not think that any fluid without corpuscles would be of great use in rapidly overcoming the condition, and he was sure that if he had to be transfused himself he would prefer blood transfusion. He strongly advocated the adoption in civil life, in mines, factories, and works, of the arrangements they had found useful in the wound casualties of war—the provision of splints, ambulances, and special resuscitation centres. Mr. J. D. Malcolm, at the request of the Chairman, stated his views as to the pathology of shock. He thought that the chief agent in shock was an expulsion of blood from the vessels as a result of contraction starting in the smaller and spreading to the larger vessels, the contraction being proportionate to the degree of irritation of the tissues. He was strongly opposed to the idea of a collection of blood in the capillaries in shock. It seemed to him that the good results produced by the introduction of fluid, on which all were agreed, pointed to the fact that fluids had been removed from the circulation. Dr. E. M. Cowell, who made a large number of blood pressure records in recently wounded men, found that two varieties of shock could be distinguished: first, "primary shock," coming on immediately in the severest wounds, often fatal; and, second, "secondary wound shock," occurring in cases where the man's life was not in immediate danger but where definite anatomical damage was present. In this case the pressure fell after some hours in the presence of the factors of cold, pain, haemorrhage, or toxaemia. He instanced the example of a case where a soldier had one leg blown off and a foot shattered and yet showed no fall in blood pressure until the onset of gas gangrene several hours afterwards. The knowledge gained ought to be applied in civil practice, and the ill effects of cold could not be too strongly emphasized. Nurses should be impressed with the value of the heated operating table and how simply an improvised heating appliance can be arranged. He had employed gum saline infusion on a large scale at the operations on Vimy Ridge in 1917, and was firmly convinced of its great utility. Except in the very worst cases they obtained a rise in pressure sufficient to enable the surgeon to remove the damaged tissues and to effect anatomical repair. He thought that where haemorrhage was not excessive, gum saline met all the requirements. He suggested its use in civil practice in a condition closely allied to wound shock, namely, in the white asphyxia of the newly born.

Major A. L. Lockwood was convinced of two important factors in the production of shock—fat embolism and lung collapse. A certain percentage of cases in France died from fat embolism. He learnt to be able to isolate in the resuscitation ward such a group of shock cases, and no remedial measures could save them. In several instances where there was either no wound or only a trivial lesion he had found clinically or at autopsy complete collapse of both lungs. This class in many cases showed remarkable improvement following the administration of oxygen. He had used gum saline infusion as a routine in shock cases as well as oxygen, and he emphasized the value of morphine given early to the wounded. Dr. J. W. McNee said that when the casualty clearing stations were near the line the shock element was not great, but when they were situated at a considerable distance from active fighting many cases arrived in an advanced stage of secondary shock. The time factor and the distance from the line were two important factors in the consideration of the production of shock. They had an opportunity of comparing the results of treatment in some 150 cases of shock. The broad results were: that a great number of men required only warmth and rest; that in the case of those who reacted at all to transfusions there was no real difference between blood transfusion and gum saline transfusion; that those reacting best and most quickly to transfusion suffered more from haemorrhage than shock, and that in a number of cases (60 to 70 out of 150) neither blood nor gum had the slightest effect. In these last they proved by autopsy that death did not result from bacterial infection, and that the wounds taken collectively showed much muscle damage. The muscle injury was very important in the production of shock. In reply to the Chairman, he said that in none of the fatal cases did he see lung collapse, and in the few where fat emboli were found histologically the condition was quite insufficient to cause death. Mr. Hamilton Drummond spoke of his experiences of gum transfusion during several months at an advanced surgical centre. He attached great importance to blood pressure observations. They had transfused as a routine all cases below 90 systolic. The gum was introduced slowly into the vein, taking twenty minutes for each pint given, and in many cases it was given also after operation. He had seen no ill effects from its use. In haemorrhage cases the rise in blood pressure was best effected by blood. In severe shock, with damage to the limbs or hollow viscera, and in cases of toxaemia, neither blood nor gum seemed to do good.

Major J. E. H. Roberts said that in 1915, when working at the base, he was struck with the high mortality of amputation cases where there was gas gangrene and where ether or chloroform was used as an anaesthetic. When gas was administered many cases recovered from the operation. He was then inclined to think they were suffering more from muscle toxaemia than septicaemia. Afterwards, at casualty clearing stations, he was confirmed in his suspicions regarding the effects of muscle injury by observing the surprising effects which followed amputation. He considered that gum solution was preferable to saline in the treatment of shock, but on the whole he was disappointed in its use and thought it inferior to blood. Colonel Lapthorn Smith advised attention to several points in all surgical operations. Before starting an operation they had to see that the blood vessels were well filled with fluid; they ought to have rehearsals by surgical teams in order to cut down time wasted. At operation as little blood as possible should be lost; the amount of anaesthetic should be cut down to a minimum; warmth should be applied to the patient by some apparatus for heating the table; the Trendelenburg position should be adopted in order to force the blood to the heart; and rectal administrations of saline should be given. Mr. Cuthbert Wallace briefly referred to the respective claims of gum and blood transfusions. It seemed to him that the proper substance to

replace blood was blood, but one could not always have the ideal. In certain cases the administration of gum was quite sufficient to tide the patient over the critical period until the regenerative mechanism of the bone marrow made good the defect. Sir Anthony Bowlby, in summing up, said that in the prevention or treatment of shock all were agreed on four points—first, morphine given early to a wounded man was very beneficial; secondly, all cases should have a liberal allowance of fluids by mouth; thirdly, that gas and oxygen provided a safe means of anaesthesia in shock; and fourthly, that if gum or blood, or, indeed, any other fluid, was to be given it must be given early.

RECONSTRUCTIVE SURGERY.

The discussion on reconstructive surgery took place in the Section of Surgery on Friday morning, under the chairmanship of Sir Robert Jones, C.B. The accommodation of the room set apart for this meeting was taxed to its utmost capacity, and many members failed to secure admission.

Major R. C. Elmslie, in opening the subject, said that the aim of the orthopaedic surgeon was to restore the functional utility of the damaged part as far as possible. The first necessity was to determine exactly what anatomical and pathological lesions were interfering with the return of function, and then to decide if surgical treatment would improve the functional utility. The surgical measures adopted included the excision of scars, repair of nerves, muscles, and tendons, the restoration of continuity in bones in good alignment, and the treatment of joints to secure stability and mobility. Where functions were definitely lost they might be replaced by such means as tendon grafting, tendon fixation, and the fixation of joints. Massage, passive movements, baths, re-educational exercises, and gymnastics had their share in restoring function. The fitting of an appliance, such as an artificial limb, and the education in its use, came within the domain of reconstructive surgery. The principles rested upon a basis of anatomy, pathology, and mechanics. He specially considered a few selected lesions in illustration. The question of the elimination of sepsis, and in particular the treatment of chronic bone sinus, was discussed. He warmly advocated Broca's radical operation for the latter condition. The non-union of fractures with the remedial measures of end-to-end fixation and bone grafting, the treatment of flail joints, and the methods of tendon transplantation, were considered briefly.

Major W. R. Bristow laid stress, in his introductory paper, on the need for co-operation between the surgeon and the physiotherapist. In the treatment of orthopaedic conditions it was often necessary to spend many months, during which perhaps several operations were performed; in the intervals between these methods of physical treatment were adopted. The surgeon was the master mind directing all treatment towards the attainment of a definite end, the restoration of function. He counselled team work in an orthopaedic unit. There ought to be frequent consultations between the officers in charge of the special departments, and such officers ought to have good clinical experience and general training to prevent the tendency towards undue specialism. He laid emphasis on the extreme need of accurate diagnosis, especially with regard to functional lesions. He dealt more in detail with the methods of re-education, and pointed out the need for recognizing the limitations of all treatment.

Captain W. C. Morton opened the discussion by asking for greater attention in orthopaedic surgery to what was too commonly diagnosed and passed over as "hysteria." The influence of suggestion, instead of being something to be scouted, was one of the most valuable forces in life. Apart from its normal workings, it was found that pathologically it might prolong an organic disease for the rest of the patient's existence, or, the organic lesion having been removed, it prolonged the functional disability for years. In many cases there was, through disuse, a paralysis of the muscular sense. To get the best results in reconstructive surgery a patient and understanding system of re-education was necessary. Colonel H. M. W. Gray, in view of our war experiences, considered that the term "reconstructive surgery" had a very wide application. Its problems had to do with far more than the late phases of wounds. As deformities, and to a lesser extent disabilities, were usually preventable, the aspect of preventive treatment ought to be considered. In civil practice virtually the same problems had to be faced as in war. Circumstances now demanded a revision of our methods of teaching, a broader outlook on surgery, a wider application of the principles established by workers in other subjects, and a greater collaboration between schools and the individual teachers in these schools. The experiences of workers in the expeditionary forces suggested lessons that might be applied at home. What had been learned in the forward areas of warfare could be applied in civil life—how to organize in mines, shipyards, and factories the treatment of fractures, the provision of transport, and the training of employees for such work. From the casualty clearing stations and base hospitals we could learn the advantages to be derived from a redistribution of our chief hospitals and their removal to the outskirts of towns, and with the provision of whole-time teachers and of students' hostels the scheme would be practical politics. Further, the intercollaboration and friendly rivalries of the workers, which had so greatly raised the standard of endeavour on active service, could be extended at home. They must listen to the voice of the younger generation. The newer schemes aimed at a prevention of disabilities. He paid a graceful tribute to the work of Sir Robert Jones.

Major Hey Groves took up certain points in restitutional surgery. He detailed the technique he employed in the reconstruction of the anterior crucial ligaments of the knee-joint by the use of the ilio-tibial band, and in the repair of the posterior crucial ligament by the semitendinosus tendon. Diagrams were shown to illustrate the methods employed. Amongst twelve cases so operated upon no bad results followed; four derived no benefit and the remaining eight were sufficiently improved to be able to follow their employment without the use of any splint or appliance. In cases where there was a gap in the radius producing great deformity, he was accustomed to excise all the scar tissue lying between the bone ends, and if this proved sterile on culture, the remedial operation was performed two months later. This consisted in removing the ragged ends of the bone fragments, a specially prepared bone graft being taken from the crest of the tibia with its periosteum and fascial covering, and the ends driven into the medullary canal on both sides. In fractures of the upper end of the shaft of the femur in which non-union or mal-union resulted he employed a somewhat similar method, first driving the peg graft from below through the great trochanter, and then, having got the fragments in correct position, hammering the projecting peg downwards until it engaged in the medullary canal of the lower fragment. An ivory peg answered the purpose as well as a tibial graft. Major Edred Corner said that reconstruction and restoration should not be confused. A patient might have a part thoroughly reconstructed and yet might not be able to make use of it. The aim of returning the patient to work should be the important factor in deciding the treatment. He directed special attention to one point in the matter of amputations: often a dead

space was left under the bone which was generally filled up with non-irritant material but which might become infected and might remain infected for years after healing had taken place. It was a frequent cause of disability, in that the fitting of an artificial limb stirred up the trouble and the patients often complained of pain and discomfort. The only sure way of getting over this was by efficient drainage. Another point to be considered was the question of the nerve endings. If the young regenerating nerves came in contact with the scar tissue, pain was apt to result, and if they were caught in a focus of repair they might give rise to certain sensations. It was not so important in amputations to cut the nerve short as to cut the vessel short, for the infective process spreads along the course of the vascular lymphatics. Captain D. M. Aitken said that in the case of bone, as in soft parts, the solution of continuity was repaired by the deposition of fibrous tissue with new-formed capillaries. The surgeon recognized the importance, in the case of soft parts, of secondary suture, as soon as the wounds were clean, in order to get union with a minimum of cicatricial tissue. In tendon suture they found that the fibrous tissue was formed along the lines of stress. In nerve suture the fibrous tissue uniting the ends is longitudinally arranged on account of the stress, and the regenerating axis cylinders had a chance of slipping through parallel to these fibres. In fractures, taking the femur as an example, there might be non-union of the fragments, though they were in apposition, if the patient was allowed to swing his leg on crutches, but if he was put in a walking calliper splint, the stresses of the thigh muscles and of the body weight pushed the bone ends together, and the bone cells would obey the laws governing them and unite the bones. In orthopaedic surgery repair was directed or controlled by stress. Major Francisco, United States Medical Corps, desired on behalf of his colleagues to pay tribute to the teachings and help of British orthopaedic surgeons. In France they had more to do with the prevention than the treatment of disabilities. They had paid considerable attention to the splinting of fractures, and certain medical officers were detailed to supervise splinting alone in the advanced areas. In the hospitals, similarly, men were told off specially to look after splinting. They evacuated first those cases which would be soonest ready for reconstructional surgery.

Sir Harold Stiles, speaking from the point of view of general surgery, said that all surgery was more or less reconstruction. The difference between the methods and problems of reconstruction in orthopaedic and general surgery consisted mainly in the fact that the former dealt largely with voluntary muscle and the latter with involuntary muscle. He hoped that orthopaedic surgery would bulk largely in the teaching of general surgery in medical schools, and he was glad that a start had already been made. Great progress had been made during the war in reconstructive surgery, and it had been accomplished, he wished to emphasize, by team work and chiefly by young men. He spoke of the principles that guided him in the treatment of flail joints and of the methods of controlling bone growth according to whether an ankylosis or a movable joint was required. Dealing with nerve suture, he contended that end-to-end union was always possible if a sufficiently free incision were made; a nerve would stand more tension than any other structure, and, even if the ends could not be got together, if the bulbs were stitched together continuity could be restored. He also gave practical details in the technique of tendon transplantation in disabilities of the hand. Major Alwyn Smith thought that the results of bone grafting in the case of the humerus were more disappointing than in other situations. He had given up grafting in the humerus. He laid stress on providing a longer support for grafts than was usually done, because he considered that osteogenesis was a very slow process. Major Naughton Dunn thought that no patient should be discharged on crutches if it was at all possible to obviate their use. He dealt with the treatment of flail joints, and the question of the position to be adopted in the cases of short humerus.

Lieut.-Colonel Spencer Mort advocated a more thorough treatment of bone cavities after sequestrotomy. He not only curetted the cavity, but rounded off all corners, and obliterated crevices till all was perfectly smooth. To prevent sepsis and to control oozing he rubbed in iodoform crystals. In chronic cases with dense eburnated bone he punched out small holes at intervals to enable the flat drill point to catch without slipping. Failure of bone grafting was largely due to sepsis, and he advocated waiting for at least three months after the bones had healed before attempting interference, and using at the operation the most scrupulous aseptic care. There were special difficulties to be reckoned with in war injuries, the nidus for the graft was often markedly bloodless and the fibrous tissue cicatrix of the soft parts was dense, and the patient was generally past the period of active bone growth. They had therefore to use some method which would allow of the most favourable growth of the transplanted bone. He himself used multiple small grafts; a portion of rib slightly longer than the distance between the fragments was taken from the patient, stripped of its periosteum, and divided longitudinally into eight separate portions with bone shears. Under a rigid scaffolding, such as a steel bone plate, these bone faggots were sprung into position and tied round with catgut. The multiplication of bone grafts gave a very much increased nutritional surface. The method had invariably succeeded. Captain Platt was accustomed to excise a clean slice from the bone ends and have them submitted to bacteriological examination before attempting grafting. He considered that in grafting the osteogenetic activity resided in the bone matrix and not in the graft itself, and that the slowness of repair was due to a loss of the osteogenetic power of the bone. Dr. G. Murray Levick spoke of the importance of not starting re-education before conductivity in the nerve was well established in cases recovering from peripheral nerve injury, because this was apt to lead to "trick movements" by opposing muscles, and by accustoming the patient to failure, to bring about that functional paresis which all were anxious to prevent. He laid stress also on the importance of open-air life for the patient.

DEMONSTRATIONS.

Demonstration on Fractured Femurs.

On the afternoon of Thursday, April 10th, Major Maurice G. Pearson, O.B.E., S.A.M.C., gave a lantern lecture on the treatment of fractured femurs, at the Imperial College of Science. After preliminary remarks in explanation of the objects aimed at, lantern slides were shown demonstrating the method of treatment recommended. It is one of the methods evolved as a direct result of war needs in France, and afterwards further developed in England when special femur hospitals were started here. It has been the routine treatment for all cases of gunshot fracture of the femur, simple and compound, at the South African Hospital in France, and at Edmonton Military Hospital, where it can be seen in use. The essential points of the method are traction by means of a special non-penetrating form of ice-tong calliper applied on to, but not into, the lower part of the shaft of the femur, thereby rendering possible early movement of the knee and leg below it without interfering with the femur; at the same time the whole limb is

left bare from hip to toe, and available for massage and electrical stimulation of muscles. Major Pearson also demonstrated the special hospital bed designed by him for fractures and back injuries, enabling any part of the patient to be reached for dressing purposes without lifting (see BRITISH MEDICAL JOURNAL, August 24th, 1918, p. 186). Photographs were shown demonstrating the excellent muscular condition of the injured limb and flexibility of joints throughout treatment by the method recommended. A cinematograph film was shown of recovered patients walking and going through exercises six months after being wounded. In conclusion Major Pearson entered a strong plea for continuity of treatment as being no less essential than good treatment, and an appeal for an improved standard of fracture treatment after the war. The teaching of fracture work, he said, had hitherto been perfunctory in the extreme, both in lectures and in books, and the disastrous results were reflected in the report of the Fracture Committee. In the future both treatment and teaching must be taken more seriously and special wards must be set aside for the purpose, working throughout in co-operation with the physio-therapeutic department.

THROAT INFECTIONS: NAKED-EYE DIAGNOSIS.

On Thursday, April 10th, Dr. H. Drinkwater gave a lantern demonstration of certain infectious and inflammatory conditions of the throat, his aim being to assist in their diagnosis by naked-eye examination alone, and to show that in most cases this could be depended upon without recourse to the microscope and a bacteriological test. He first pointed out the main naked-eye characteristics of diphtheria, and afterwards showed how other inflammatory and infectious conditions differed from it. With regard to the texture of the patch, it could not be too strongly insisted that the diphtheritic patch formed a *raised deposit on* the mucous membrane. When on the inner aspect of the tonsil, it projected beyond the surface of the surrounding tissues. It was not an excavation or ulcer, like that often observed in scarlet fever and influenza. With regard to the distribution of the patch, each lateral half of the fauces might be divided into three areas—tonsillar, uvula (half), and soft palate (half), including the anterior pillar. An extremely important point in diagnosis was that the diphtheria patch in any one of these areas was single. On one tonsil there was only one patch, and this patch, if it increased in size, did so centrifugally; its margin continued to extend, so that it might unite with a patch on the palate or uvula, but it sent out no separate colonies or islets. This feature of diphtheria often by itself sufficed for diagnosis. It was only in the late stage of diphtheria that several disappearing patches might be seen in any single area. What had been said of the tonsillar area was equally true of the uvular and the palatal areas, in each of which the diphtheritic patch was single. Of the three lateral areas, the tonsillar was most often involved, it rarely escaped if one of the other areas was attacked. The uvular area probably came second in order of frequency. The colour of the patch, when seen in an early stage, was most frequently bluish-white, sometimes almost pure white, and occasionally yellowish. Later it might be pale brown, or covered with grey spots or blackish. The margin of patch was always very sharply defined, and equally so around the whole circumference. Vincent's angina closely resembled diphtheria, and sometimes could not be distinguished from it except by a bacteriological examination. As regards texture of the patch, distribution, and colour, the two diseases were identical. In a fair number of cases of Vincent's angina there might be observed two distinguishing peculiarities. The patch tended to become much thinner below than above, and a narrow and deep fissure or depression might be seen in the centre of the patch, especially over the tonsil. At a later stage erosion of the uvula was characteristic, but the diagnosis should be made before that stage was reached. Diphtheria and Vincent's angina might occur together in the same patient. If in influenza the throat was affected so as to raise a suspicion of diphtheria or Vincent's angina, the sores would be found confined to the tonsillar area, generally of a bright yellow colour, often multiple, and either depressed, or, if raised, easily wiped away with a probe. The throat was generally more painful, and the temperature higher. In scarlet fever the sore was an ulcer and there was intense congestion with a punctate rash. Follicular tonsillitis gave great swelling of the tonsils, and the discharge could be seen oozing out of several of the tonsillar crypts.

ROYAL COLLEGE OF PHYSICIANS.

On the afternoon of Thursday, April 10th, the President and officers of the Royal College of Physicians of London received a considerable number of members of the Association and visitors at the College. The President (Dr. Norman Moore) conducted the guests round, showing them the portraits of physicians and briefly describing in his inimitable manner some of the treasures of the library. Perhaps the newest among the many interesting objects displayed in the reading room was the framed congratulatory address presented to the College by the Fellows serving in France, who dined together at Boulogne on September 23rd, 1918, in celebration of the quatercentenary of the granting of its charter to the College by King Henry VIII. After tea a most instructive and entertaining occasion was brought to a close by the delivery, by Sir Humphry Rolleston, of the third of his Lumleian lectures on cerebro-spinal fever.

FACIAL SURGERY.

A demonstration of cases of plastic surgery of the face was given at the Imperial College on Thursday, April 10th, by the staff of Queen's Hospital, Sidcup. The cases shown were patients who had had mutilating wounds of the face, especially loss of the nose or the greater part of the jaw, and the contrast between the results obtained by ingenious grafting of bone, cartilage, and soft parts, and the previous condition seen in the photographs or casts was particularly striking. The officers present in charge of the cases gave particulars of the methods they had adopted. Some of the cases were in process of restoration, and what might still be attained in them was seen in others who had passed through the surgeon's hands.

MAUDSLEY HOSPITAL.

On the afternoon of Friday, April 11th, an instructive clinical and pathological meeting was held at the Maudsley Neurological Clearing Hospital; some sixty members and visitors were present and the demonstrations were greatly appreciated. Lieut.-Colonel F. W. Mott, F.R.S., gave a demonstration of clinical cases, and this was followed by a demonstration by Dr. F. L. Golla on the psycho-galvanic reflex in cases of functional war neuroses. Dr. Golla also showed the rotating chair. Dr. L. E. Stamm exhibited an apparatus for testing the mental reaction, used by him for investigating the response of candidates for the Royal Air Force (BRITISH MEDICAL JOURNAL, February 1st, 1919, p. 129). This he had utilized also for the Scientific Committee of the Board of Liquor Control for testing the effects of alcohol in varying doses on the mental reaction time.

AT a meeting of the Central Midwives Board on April 15th Sir Francis Champneys was unanimously re-elected chairman. A letter was received stating that in the opinion of the Privy Council the question of any modification of the constitution of the Board should be left to be dealt with by the new Ministry of Health, and that no action in the matter should be taken at present. The Board met on the following day for the hearing of penal charges. Out of ten fresh cases, six women were removed from the roll, and another one on an interim report. Two midwives charged with negligence in cases of ophthalmia were acquitted, and awarded costs not exceeding £5, on the application of their solicitor.

Correspondence.

THE CARLISLE EXPERIMENT IN LIQUOR CONTROL.

SIR,—On Saturday, April 19th, I read with very great interest Dr. Henry Barnes's article in the JOURNAL on the Carlisle experiment in local control. This article makes it abundantly clear that the experiment has been very successful. He states "that although no statistics can be produced, there has undoubtedly been a resulting improvement in the economic efficiency of the people, and a reduction in misery, crime, and degradation of every sort, which can easily be imagined."

I think most medical men would admit that the restrictions in the hours of the sale of liquor which have been imposed on the nation during the war have been extremely beneficial, and have led to no great hardships. The majority of us would be very sorry to see a return to the old order, the long hours, and the innumerable temptations to drink which beset the path of the working man and woman in every part of the country.

On Sunday, April 20th, I read a very important article in the *Observer*, entitled "Critical Hours for Social Progress," in which the writer states that during the past week the "trade" had held a national convention representative of the retail liquor traffic, and that at the meeting the "trade" had expressed the intention, if possible, to free the sale of drink from all the restrictions which the sole interests of national temperance and efficiency in war time had imposed upon it. It is devoutly to be hoped that there is a large body of medical men who, without wishing to prohibit the sale of alcohol, are in favour of restrictions which have proved beneficial, and who will be ready to use their influence—and their influence may be very great—to prevent the existing restrictions being swept away.—I am, etc.,

Oxford, April 21st. WM. COLLIER.

"HALF A CENTURY OF SMALL-POX AND VACCINATION."

SIR,—In his reply to my Milroy lectures Dr. Killick Millard (p. 484) refers to the Registrar-General's statistics of diminishing small-pox mortality between 1847 and 1880, contemporaneously with increasing infantile vaccination, and he relates how even he had quoted and relied on these statistics in a pro-vaccination lecture. His reliance was more than justified. During the period in question up to the pandemic of 1870–73 natural small-pox was becoming a more fatal disease, and was, indeed, reaching its maximum of epidemic virulence. Yet under these circumstances increase in the practice of vaccination caused a notable decline of small-pox mortality rates per million living, and the remarkable position resulted that whilst the fatality of natural small-pox was rising, mortality was falling. In more recent years small-pox has become so attenuated in type that fatality as well as mortality has marvellously decreased, and the fact that this decrease has taken place notwithstanding lessened resort to vaccination brings into all the greater prominence the change in the character of the disease. It is not to be doubted that had small-pox maintained its old infectivity and severity, vaccination would have continued to be practised on a much larger scale than at present.

I think Dr. Millard's other points are dealt with sufficiently in the lectures, and I shall not occupy space with a condensed recapitulation here, but will reprint the whole reply as an appendix to the lectures in book form, so that whoever may be interested can make comparison. But the crucial fact is the great change in small-pox in respect both of fatality and infectivity.—I am, etc.,

Edinburgh, April 21st. JOHN C. MCVAIL.

GUNSHOT WOUNDS OF THE CHEST.

SIR,—I fear that I must have been very incoherent in the remarks I made at the discussion on chest wounds at the Clinical Meeting, in that I am reported to have "doubted whether the results of surgery were striking."

Having had the opportunity of watching the evolution of chest surgery during the war, I am an enthusiast for operating on the right type of case. What I wished to convey was that the surgeon had placed on an unassailable basis the necessity for operation in certain classes of wounds—for example, the "open" chest, the large retained foreign body, the comminuted fracture of ribs, the lacerated diaphragm, etc.—but that the question of the advisability of operating on the simple haemothorax, forming a very considerable proportion of all chest wounds, had not yet been answered. Much more information as to the late results of the operated cases, as contrasted with the non-operated, was needed before a definite conclusion could be reached.

That any one could doubt the success of surgery in the classes specified above would, in my opinion, indicate that he was wilfully blind to one of the most valuable lessons of war surgery.—I am, etc.,

Plymouth, April 12th. A. BERTRAM SOLTAU.

SIR,—At the Special Clinical and Scientific Meeting of the Association I did not intervene in the discussion on chest wounds because I had, on a recent visit to America, given an account of my experience on this branch of surgery, and because a paper by me on the later stages of gunshot wounds of the chest appeared in the January number of *Surgery, Gynecology, and Obstetrics*. I thought I would like to wait until further experience enabled me to speak with fuller knowledge. However, several of my friends, whose opinions I value highly, say that I ought to have contributed to the discussion, even in spite of repetition.

There are certain cases among those suffering from the late effects of gunshot wounds of the chest which every surgeon would consider required operation, such, for instance, as those with sinuses or localized empyemata. There are also very many cases that have been dubbed "chest wounds," or "foreign bodies in the chest," in which a not very elaborate investigation shows the injury to have been limited to the parietes; but these cases are always looked upon as "chest wounds," and are rather like the D.A.H. patients, referred to by many observers, who, if once they get the idea that they are suffering from cardiac mischief, cannot disabuse their minds of the potential seriousness of their condition. When these patients harbour foreign bodies they can easily be relieved by surgical means, and it is always well worth while so do so, as the mental relief is so great an advantage to them.

The cases of retained foreign bodies in the lung itself are in quite a different category. The experience of very many cases has given rise to a general impression that such foreign bodies become safely encapsuled and are harmless, and I have had ample opportunities of seeing such patients and making notes of their condition. But we have not yet enough evidence to say in what proportion of cases this happy state obtains, and we need all the information we can acquire as to the natural history and ultimate fate of foreign bodies in the lung.

There is, however, a residue of cases in which the foreign body is the cause of troublesome symptoms. Perhaps I have seen an unusual number, having been especially interested in this subject since the early days of the war, and in that way having perhaps attracted an undue proportion of the variety to which I am now referring. In this class there are cases in which a foreign body is the cause of a distressing chronic cough, or of recurring haemoptysis, and in rarer cases the focus for an infection which keeps up a purulent discharge into the bronchi continuously. These conditions can only be cured by removal of the foreign body, and experience has now proved that this can be done with a great degree of safety.

There is still a third group in which the foreign body is merely a source of mental anxiety to the patient, but so great an anxiety as to perpetuate a state of neurasthenia, which is very detrimental to his welfare. It was this class of case which first led me to assay operative interference, and my first patient, from whom I removed a rifle bullet from the middle of the lung in July, 1915, is now a happy and contented workman, able to do almost as good a day's work as before the casualty. As a result of my experience in those cases I was led to consider the part which adhesions might play in the cases of persistent pain and especially shortness of breath. This is an aspect of the matter with which Major-General Sir Berkeley Moynihan has frequently dealt. Encouraged by the great relief of all these symptoms which a thoracotomy for the

removal of the foreign body often brought about, I was led to make a surgical attack on several of the cases in which there was no foreign body, but who suffered from collapsed chest or contracted chest, and even on patients without marked physical signs, but with aggravated shortness of breath, and in whom examination with the fluorescent screen showed a too limited movement of the lung and diaphragm.

In this group I have dealt with unabsorbed haemothorax; cases in which layers of organized blood clot embarrassed the lung; and others in which there were only multiple separate adhesions or a general fixation of the whole of a considerable area of the lung. All these cases have been improved as a result of the interference, and I am persuaded that much can be done for their relief.

At a meeting of the Northern Command Medical Society, held in February of this year at Newcastle, I was able to show examples of all the varieties of the later stages of gunshot wounds of the chest. The patients had been operated upon from a few months to as long as three years and with the most encouraging results. All were greatly relieved of their disability, and in some cases their earning capacity had been fully restored.—I am, etc.,

Newcastle-upon-Tyne, April 17th. G. GREY TURNER.

A WAR COMRADES' CLUB.

SIR,—Captain K. M. Walker's letter in your issue of February 22nd raises two important points which were often discussed in R.A.M.C. circles abroad. The first is the representation of medical men who have served overseas, on the various committees formed to safeguard the interests of the profession. The second is the desirability of forming an association of medical men who have served overseas. It seems to me that were such an association formed, its members would be able to make their voices heard in the arena of medical politics with no uncertain sound.

Those who have worked together for, and with, the army may have mixed feelings on looking back on their various experiences—some may feel that their services might have been of more use in another capacity than that in which they were compelled to serve, others may feel that they had not enough to do, while with others the most outstanding memory may be that of interesting but laborious days and nights spent in following their professional calling.

Pre-eminent above everything else, however, is the memory of the professional brotherhood which existed in the B.E.F. and which is so sadly lacking in the ranks of those who stayed at home. Is this comradeship to be preserved as Captain Walker asks, or are we going to forget the valuable lesson of team work and the professional harmony, free from professional jealousy, which reigned on the battle-fronts? Whatever may be in store for the medical profession, and whatever may be the opinions of the individual members of the B.E.F. on the different policies advocated for safeguarding their interests, I am certain that on the question of the formation of an association for ex-temporary members of the R.A.M.C. there can only be one answer. That is, that the association be immediately formed. While its fundamental basis would be to continue the friendships formed on active service, questions relating to the profession would naturally come under review; and these could be discussed and resolutions could be arrived at in that atmosphere of friendship and mutual help which is the inheritance of the mutual bond of self-sacrifice.

Might I suggest that, with Sir Anthony Bowlby as president and with Captain Walker as secretary, there would soon be gathered together the whole of the members of the R.A.M.C., recruited from civilian life, who served in the B.E.F.? Will these two distinguished members of the profession call a meeting at an early date to start the ball a-rolling?—I am, etc.,

LATE SURGICAL SPECIALIST B.E.F.

SCOPOLAMINE-MORPHINE IN CHILDBIRTH.

SIR,—In the *Times* of April 4th I note that a resolution was passed and forwarded to Mr. Lloyd George urging the Government to place the benefits of "twilight sleep" within the reach of all mothers. As the advisory council includes well known names, it appears to me that the subject is not one which can be treated lightly by the medical profession. In my book "*Twilight Sleep*" *in the East*, published in 1918, I advocated a somewhat similar procedure on the part of the Government, and gave my own experience of the treatment in India, where I have been acting as specialist in midwifery and diseases of women for the last four years. The point which impressed itself upon me in cases so treated was not so much the fact that the patient remembered little or nothing of the confinement, as that her condition the day following was infinitely better than was that of the cases which were allowed to suffer the pains of childbirth unrelieved. Modern physiology has taught us that pain has a definite action on the nervous system and suprarenal activity, but, in addition to pain, we must consider the emotional disturbances and the after-effects of fear, anxiety, and apprehension of danger, not only in primiparae but also in multiparae who have had previous abnormal confinements. In my opinion scopolamine-morphine semi-narcosis obviates this, and reduces obstetric shock to a minimum. Late first pregnancies are especially dangerous to the mental stability of the patient, and it must never be forgotten that the anticipation of pain is often of greater moment than its realization.

But the opponents of "twilight sleep" put forward arguments which must be listened to and respected. They complain that it is quite impossible for a busy practitioner to devote sufficient time to each case to guarantee success. To overcome this difficulty I worked out doses which I found to be both safe and effective if given by a trained nurse between the visits of the medical man in charge of the case, who, on his arrival, can decide for himself whether the condition is satisfactory, and can act accordingly. Others object that the "memory test" is not reliable, but if it be considered in conjunction with other symptoms—as, for example, incoherence, flushed face, pulse rate, inco-ordination, and the state of the pupils—there should be no difficulty in gauging the doses which should be given. I acknowledge that it requires experience to read these symptoms correctly, but the same may be said to apply to the skilful administration of any anaesthetic. Gauss considered that it required two years' practice to perfect oneself in the "twilight sleep" technique; and although I do not agree with him in this contention, I do think that it requires both study and practice. The bad effect on the child is, I am sure, grossly exaggerated, and when present is due either to faulty dosage, or to the fact that morphine is given too late in the confinement. Even when apnoea or oligopnoea is present the baby, if placed on its side, will be normal shortly afterwards, but these conditions are only seen in a small proportion of cases when the proper technique is faithfully carried out.

The method has come into disrepute because the medical profession as a whole has condemned it before giving it a fair trial. This attitude has induced unqualified women to write most of the literature on the subject, and resulted in "Twilight Sleep Homes" being advertised in the daily press. Although this is to be regretted from an ethical point of view, it should not deter medical men from continuing their investigations in their own practices, for it is only by this means that we can arrive at a more simple technique. The cases of failure are in no small measure due to the fact that medical men who have not thoroughly studied the subject have ignored many of the minor details of the technique without which success is problematical. I consider that where it is feasible and the patient can afford it one medical man should give the injections and another deliver the patient, and I agree with Fehling that it is not every doctor who displays capacity for carrying out the proper technique.—I am, etc.,

London, W., April 13th. CECIL WEBB JOHNSON.

THE NAVAL MEDICAL SERVICE.

SIR,—I have inadvertently given a wrong impression by my letter, and I must apologize for so doing to the Medical Director-General of the Navy.

It was my desire to point out that the directions for using the anti-influenzal vaccine were not available for the medical officers of ships at the time they were ordered (by an Admiralty order) to lecture to the ship's company and call for volunteers. On obtaining a certain number of

volunteers for the vaccine we were to order the proportionate quantity of vaccine. With the vaccine came the statement referred to by Surgeon Commander W. L. Martin, R.N. My suggestion is that medical officers should have been in the position to advise upon the use of this vaccine before lecturing upon it or advising its use to the ship's company. Not knowing the composition at the time, I was unable to inform my captain whether it was probable or not that inoculated men would have to be placed on the sick list for six hours, and being at short notice it was a matter of importance to us to have the ship's company ready for instant service.

We were not treated in this matter as scientific colleagues and advised by our own branch prior to the issuing of an Admiralty order. This, I hope, makes my point clear.—I am, etc.,

W. KENNETH WILLS,
Clifton, April 14th. Acting Surgeon Commander R.N.V.R.

The Services.

NAVAL MEDICAL DEMOBILIZATION.

WITH reference to the letter on this subject by "Temporary" in the JOURNAL of April 19th (p. 502), we are requested by the Director-General of the Medical Department of the Navy to state that: (1) So far as the Royal Navy is concerned, the Central Medical War Committee has not been wound up, but is still dealing with demobilization of medical officers, R.N. and R.N.V.R., as hitherto; and (2) the agreements signed by temporary medical officers on entering the Royal Navy will be honoured as a matter of course in all cases.

HONOURS.

ORDER OF THE BRITISH EMPIRE.

Transfers to Military Division.

THE King has directed that the following appointments to, and promotions in, the Order of the British Empire announced in the *London Gazette* of the dates indicated, shall be transferred to the Military Division of the Order:

Knight Commander (K.B.E.).

Colonel Sir James Galloway, C.B., A.M.S. (January 7th, 1918).

Commanders (C.B.E.).

Miss Jane Holland Turnbull, M.B., B.S., Q.M.A.A.C. (June 7th, 1918).

Colonels: William Molesworth, C.I.E., V.H.S., I.M.S. (December 19th, 1918), Robert Dawson Rudolf, Canadian Forces (January 7th, 1918), Alfred William Sheen, A.M.S.(T.F.) (December 19th, 1918).

Lieut.-Colonel John Tweedy Lewtas, R.A.M.C. (January 7th, 1918).

Officers (O.B.E.).

Fleet Surgeons: Frank Bradshaw, R.N. (June 7th, 1918), Alfred Ernest Weightman, R.N. (June 7th, 1918), Samuel Henry Woods, R.N. (June 7th, 1918).

Staff Surgeon Reginald John E. Hanson, R.N.V.R. (June 7th, 1918).

Brevet Colonel G. Sims Woodhead, V.D., A.M.S. (January 7th, 1918).

Lieut.-Colonels: Alexander Bruce, R.A.M.C. (June 7th, 1918), Joseph Dalrymple, R.A.M.C. (June 7th, 1918), Bertram Ramsay Dennis, R.A.M.C. (June 7th, 1918), Charles Edward P. Fowler, R.A.M.C. (March 15th, 1918), John Alexander Gunn, C.A.M.C. (June 7th, 1918), Charles Duncan Myles, R.A.M.C. (June 7th, 1918), Ernest Reinhold Rost, I.M.S. (November 18th, 1918).

Temporary Lieut.-Colonel Donald Macaulay, R.A.M.C. (November 18th, 1918).

Majors: Edward John Buckley, R.A.M.C. (June 7th, 1918); Samuel Richard Christophers, C.I.E., I.M.S. (November 18th, 1918), Thomas Seymour Coates, R.A.M.C. (June 7th, 1918), Charles Sempill De Segundo, R.A.M.C. (January 8th, 1919), William Bickerton Edwards, R.A.M.C. (June 7th, 1918), Edward Gibbon, R.A.M.C. (November 18th, 1918), John Green, R.A.M.C. (June 7th, 1918), George Home, M.D., New Zealand Military Forces (June 7th, 1918), Frederick Percival Mackie, I.M.S. (November 18th, 1918), William Lewis Martin, R.A.M.C. (June 7th, 1918), Thomas Lindsay Sandes, M.B., South African Forces (June 7th, 1918), Charles Edward Southon, I.M.S. (November 18th, 1918), Alexander Lewis Urquhart, R.A.M.C. (June 7th, 1918); Albert Elijah Walter, I.M.S. (December 19th, 1918), John Wilson, R.A.M.C. (June 7th, 1918).

Captains: William Dunlop, R.A.M.C.S.R. (November 18th, 1918), David Hammand Fraser, M.C., R.A.M.C. (November 18th, 1918), Richard Edward Gibson, R.A.M.C. (June 7th, 1918), John Molyneux Hamill, R.A.M.C. (June 7th, 1918), William Percival Mulligan, R.A.M.C. (June 7th, 1918), John Glyn Pigott, R.A.M.C. (June 7th, 1918), John Wallace, R.A.M.C. (June 7th, 1918).

Temporary Captains: David Forbes Borrie, R.A.M.C. (November 18th, 1918), Edward Norman Glover, R.A.M.C. (November 18th, 1918).

Members (M.B.E.).

Lieut.-Colonel Harry Hyndman Balfour, R.A.M.C. (January 7th, 1918). Major Harold Octavius Lethbridge, R.A.M.C. (June 7th, 1918).

Captains: Raymond Bury, Nyasaland Medical Service (November 18th, 1918), Wilberforce Vaughan Eaves, R.A.M.C. (June 7th, 1918), William Herron Elliott, R.A.M.C.S.R. (November 18th, 1918), Geoffrey Baimano Fleming, R.A.M.C.T.F. (November 18th, 1918), Alfred Harwood, R.A.M.C. (June 7th, 1918).

Temporary Captains: Geoffrey Douglas Hale Carpenter, Uganda Medical Service (November 18th, 1918), Donald McIntyre, R.A.M.C. (November 18th, 1918). Lieutenant John Ritchie (June 7th, 1918).

Surgeon Lieutenant Francis Ewart, R.N., has been appointed O.B.E. (Military Division) for valuable services in H.M.S. *Patuca* whilst employed on ocean escort duties.

The Distinguished Service Cross has been conferred upon Surgeon Lieutenant Neville Hardcastle Smith, R.N., in recognition of the bravery and devotion to duty displayed by him in carrying out his professional duties during the battles in the Ussuri district between August 14th and 28th, 1918.

Surgeon Commander Charles James E. Cock, R.N., and Surgeon Lieutenant John Forrest Smith, R.N., have been mentioned in dispatches.

CASUALTIES.

DEATHS OF SONS OF MEDICAL MEN.

Flight Sublieutenant Edward Cuthbert Stocker, R.N., reported "missing" on March 27th, 1918, while flying in the neighbourhood of Dompierre, on the Somme, now officially presumed killed on that date, aged 18½, was the younger son and only surviving child of Major E. G. Stocker, R.A.M.C.(T.F.), now on service, of Carn Brea, Cornwall. He took the R.A.C. pilot's certificate in 1917, was gazetted to the R.N.A.S., and went to the front in February, 1918. His brother, Second Lieutenant T. F. Stocker, R.E., was killed near Ypres in 1915.

THE office of the Adviser in Pathology to the British Expeditionary Force having been closed owing to demobilization, all correspondence for Colonel S. L. Cummins, A.M.S., should be addressed to him at the Pathological Laboratory, Royal Army Medical College, Grosvenor Road, London, S.W.1.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

Examination in Sanitary Science.—The following candidates have satisfied the examiners in both parts of the examination:

K. Biggs, Winnifred J. Crawford, F. P. G. de Smidt, Major N. V. Lothian, M.C., R.A.M.C., J. J. McConnell, Katherine McNeill, F. Mahabir, Captain W. A. Murphy, R.A.M.C., Captain A. T. H. Nisbet, A.A.M.C., T. E. Parker, Winifred H. Sharrard, H. N. Stafford.

UNIVERSITY OF LONDON.

SENATE.

THE resignation by Professor Vaughan Harley, owing to ill health, of the chair of pathological chemistry at University College, has been accepted with regret. A resolution expressing the Senate's appreciation of the valuable work which he had carried out during his twenty-three years' tenure of the office was adopted.

The degree of D.Sc. in biochemistry was conferred on E. C. Gray, an internal student of the Lister Institute of Preventive Medicine for a thesis on the enzymes of *B. coli communis* (*Proceedings*, Royal Society, 1914 and 1917).

Sir Bertrand Dawson has been appointed one of the representatives of the Faculty of Medicine on the Senate, in succession to Professor F. W. Andrewes, F.R.S.

Presentation day will be held in the Albert Hall on May 9th at 3 p.m., when the President of the Board of Education will deliver an address. The service for members of the university will be held at Westminster Abbey on Friday, May 9th, at 6 p.m.

Professor F. A. Bainbridge will give a course of eight lectures on the physiology of muscular exercise, in the Physiological Department, St. Bartholomew's Hospital, on Wednesdays, at 4.30 p.m., beginning on April 30th.

Applications for the university chairs of anatomy, tenable at Guy's Hospital Medical School and at the London (Royal Free Hospital) School of Medicine for Women respectively, with an initial salary of £600 a year each, must be received by the Academic Registrar at the university by May 3rd.

It was resolved as a war measure to hold an additional first examination for medical degrees in September, 1919, provided not less than twenty-five candidates enter therefor.

UNIVERSITY OF BIRMINGHAM.

DR. BERNARD HART, lecturer in psychotherapy for the current year, will deliver a course of ten lectures on psychotherapy in the treatment of the psychoneuroses, in the large theatre of the medical school buildings, Edmund Street, Birmingham. The lectures will be given weekly, on Tuesdays at 4 o'clock, beginning on April 29th. A post-graduate course of lectures (with clinical demonstrations) on venereal disease will be given by Dr. A. Douglas Heath at the anatomical theatre of the medical school buildings, on Mondays, May 5th and 12th, and Thursdays, May 8th and 15th, at 4.30 o'clock. Both courses are free to members of the medical profession and students of the university, whose attendance is invited.

UNIVERSITY OF EDINBURGH.

AT a meeting of the Edinburgh University Court on April 14th Dr. Drever Coombe was appointed Lecturer in Psychology for five years from October 1st next. The court accepted with great regret the resignation of Sir Ludovic Grant from his office as secretary to the university.

UNIVERSITY OF GLASGOW.

THE degree of M.D. was conferred, on April 22nd, upon William Ernest Boyd.

CONJOINT BOARD IN SCOTLAND.

THE following candidates, having passed the final examination, have been admitted L.R.C.P.E., L.R.C.S.E., L.R.F.P. and S.G.:

P. de V. Moll, D. L. Henderson, J. A. S. Campbell, F. Lockwood, Hassan Amin Mddwar, D. D. Fernandes, R. L. Wright, L. L. Steele, J. M. Speirs, S. H. Waddy.

Obituary.

ERNEST NICHOLSON CUNLIFFE, M.D.VICT.,

M.B., B.S.LOND., M.R.C.P.LOND., MAJOR R.A.M.C.(T.F.),
Honorary Physician, Manchester Royal Infirmary.

BY the death of Dr. E. N. Cunliffe the Manchester school of medicine has lost a physician of great ability. A member of a Bolton family, he was educated at Monmouth Grammar School. In 1896 he entered the medical school of Manchester University, and after a brilliant studentship, during which he obtained many scholarships and prizes, he graduated in medicine in the universities of London and Manchester. After holding several resident hospital appointments he obtained the M.R.C.P.London in 1906, and was elected to the honorary staff of the Manchester Royal Infirmary at the early age of 28 years. Subsequently he became Lecturer in Clinical Medicine in the University of Manchester. As a teacher he early achieved a considerable reputation, and as an organizer and administrator he possessed unrivalled qualities. At the commencement of the war he was a member of the staff *à la suite* of the 2nd Western General Hospital, and in the following year he was appointed registrar of this hospital with the rank of major. In April, 1917, he became acting officer commanding the hospital with the rank of lieutenant-colonel, a position he held with conspicuous success until the beginning of his last illness in September, 1918. From November, 1917, to May, 1918, he served in France with the 57th General Hospital, where he was extremely popular with all ranks in the unit. During recent years there were indications that his interests were becoming directed towards the forensic aspects of medicine, and for some time he had acted as medical referee under the Workmen's Compensation Act.

His untimely death at the age of 41, after a long and painful illness, has deprived Manchester of an able physician and the medical school of an upright and loyal colleague. In the world of sport he was a good all-round athlete. At "rugger" he was an excellent half-back; as a runner he represented Manchester University both in the mile and quarter-mile races; at lawn tennis his play was much above the average, and at fives he had few superiors, but it was perhaps as a pedestrian that his dogged and untiring quality revealed itself, and therewith one of the essential traits of his character. He died at the Officers' Hospital, Windermere, and he was buried on April 3rd at St. Mary's, Windermere, with military honours; the bearer party was composed of non-commissioned officers of the 2nd Western General Hospital. Many of his old friends and colleagues were present at the ceremony, and a memorial service held in Manchester was very largely attended by friends, colleagues, and members of the 2nd Western General Hospital.

COLONEL ROBERT CALDWELL, Army Medical Staff (retired), died in a nursing home at Babbacombe, Devonshire, on April 4th, aged 59. He was the younger son of Robert Caldwell of Charleston, South Carolina, and was born in New York on October 30th, 1859. He was educated at the Westminster Hospital, and took the diplomas of M.R.C.S. and L.R.C.P.Edin. in 1883, also subsequently the F.R.C.S. Eng. in 1890, and the D.P.H. of the Scottish Colleges in 1901. After filling the post of assistant house-surgeon of Westminster Hospital, he entered the R.A.M.C. as surgeon in 1885, and became colonel in 1917. He served in the Soudan campaign of 1885–86, in the Frontier Field Force, receiving the medal and Khedive's bronze star; and in the South African war of 1899–1902, gaining the King's and Queen's medals; and had also gained the Royal Humane Society's medal. While in the army he devoted himself chiefly to sanitary work, and had held charge of the district laboratories at Meerut and Aldershot. He gained the Parkes Memorial Prize in 1904 with an essay subsequently published on the *Prevention of Disease in Armies in the Field*, and edited the second edition of *Military Hygiene* in 1910.

LIEUT.-COLONEL JOHN BATTERSBY, R.A.M.C. (ret.), died at Knocknamoe, Omagh, Tyrone, on April 8th, aged 62. He was born in Dublin on May 19th, 1856, and educated at Trinity College, Dublin, where he graduated M.B. and B.Ch. in 1879. He entered the army as surgeon on February 5th, 1881, became surgeon-major on February 5th, 1893, and lieutenant-colonel on February 5th, 1901, went on temporary half-pay on October 2nd, 1910, and retired on May 19th, 1911. He served in the Egyptian war of 1882, when he was present at the battle of Tel-el-Kebir, and received the medal with a clasp, and the Khedive's bronze star; in the Chitral expedition of 1895 (medal with clasp); and in the Nile expedition of 1898, when he took part in the battle of Khartoum, and received the medal with a clasp, and the Egyptian medal. He rejoined for service in 1914.

BRIGADE-SURGEON WILLIAM TEMPLE, V.C., R.A.M.C. (ret.), died at Tunbridge Wells on February 13th, aged 85. He was the only son of the late Dr. William Temple, M.D., of Monaghan, where he was born on November 7th, 1833. He was educated at Trinity College, Dublin, where he graduated as B.A. and M.B. in 1858, taking the L.R.C.S.I. in the same year. He entered the army as assistant surgeon on November 1st, 1858, becoming surgeon on November 1st, 1870, surgeon-major on October 1st, 1873, and brigade-surgeon on April 10th, 1885, retiring on November 1st, 1889. He served, as medical officer in the Royal Artillery, in the New Zealand wars, in the Taranaki campaign in 1860–61, and in the Waikato campaign of 1863–65, when he took part in the actions of Tearei, Rangariri, and Rangiauhia, was mentioned in dispatches, received the medal, and gained the Victoria Cross, which was conferred upon him and Lieutenant A. P. Pickard, on September 22nd, 1864, for gallantry described as follows in the *Gazette*: "For gallant conduct during the assault on the enemy's position at Rangariri on November 20th, 1863, in exposing their lives to imminent danger in crossing the entrance to the Maori keep at a point on which the enemy had concentrated their fire, with a view to render assistance to the wounded, more especially to the late Captain Mercer, R.A." In his later service he was for some years secretary to the Principal Medical Officer, H.M. Forces in India, and was an honorary surgeon to the Viceroy.

Medical News.

DR. J. BRINDLEY-JAMES has been elected a member of the Barnes District Council.

A COURSE of lectures and demonstrations will be given on Wednesdays, at 4.30 p.m., at the Brompton Hospital for Consumption, beginning on Wednesday, April 30th.

SIR G. ANDERSON CRITCHETT, BT., K.C.V.O., has been appointed a Knight of Grace of the Order of the Hospital of St. John of Jerusalem in England.

THE annual medical missions meeting of the Society for the Propagation of the Gospel in Foreign Parts will be held on Wednesday, April 30th, at 8 p.m., in the Church House, Westminster.

AT a joint meeting of the Faraday Society and the Röntgen Society, on Tuesday, April 29th, a general discussion on the examination of materials by *x* rays will be held in the rooms of the Royal Society, Burlington House, London, W.1, by kind permission of the Council, from 5 to 7 and from 8.30 to 10 p.m. The chair will be taken by Sir Robert Hadfield, Bt., F.R.S., President of the Faraday Society, who will introduce the discussion.

SIR JOHN ROSE BRADFORD, K.C.M.G., will give a discourse at the Royal Institution of Great Britain on Friday afternoon, May 30th, on filter-passing virus in certain diseases. On the following Friday Sir Ernest Rutherford, who has recently succeeded Sir J. J. Thomson as Cavendish

Professor of Experimental Physics at Cambridge, will deliver a discourse on atomic projectiles and their collisions with light atoms.

A FRENCH Urological Society has recently been formed in Paris. The honorary president is Professor Guyon, the annual president M. Legueu.

THE activity of the Italian Society of Internal Medicine has been suspended during the war. At a meeting of the Directing Council in Rome on March 9th, under the presidency of Professor Maragliano, it was decided that the next congress should be held towards the middle of October next, if possible, at Trieste.

WE learn from the New York *Medical Record* that the U.S. War Department now announces that deaths in the American Expeditionary Forces and among troops in the United States from all causes numbered 107,444. In the Expeditionary Forces the total was 72,951. Of these, 20,829 were caused by disease, 48,768 by injuries in battle, while 3,354 resulted from other causes. The deaths from disease amounted in all to 32,737 and from other causes to 1,756, making a total of 34,493. The deaths from disease exceeded the battle casualties by 5,000.

A SPECIAL post graduate course on diseases of the thyroid and parathyroids, arranged in conjunction with the Fellowship of Medicine, will be given at the London School of Medicine for Women and the Royal Free Hospital, Gray's Inn Road, during May. The course will include an account of the anatomy, physiology, chemistry, and pathology of the organs, and medical and surgical applications. Communication should be made to the Warden at the school by April 30th.

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

CORRESPONDENTS not answered are requested to look at the Notices to Correspondents of the following week.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

The postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2631, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London;* telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin.

QUERIES AND ANSWERS.

A MEDICAL man who has been appointed a justice of the peace asks for the name of some handbook on law which would give him such legal information as he may need in the discharge of his duties as a magistrate.

LETTERS, NOTES, ETC.

MESSRS. F. DAVIDSON AND CO., optical, surgical, and electrical instrument makers of Great Portland Street, W., ask us to state that they have no connexion with a Mr. Davidson who is stated to be touring certain parts of the country and advertising consultations for spectacles, etc.

ELIGIBILITY OF DISTRICT M.O.H. FOR MEMBERSHIP OF COUNTY COUNCIL.

"M.O.H." inquires if a medical officer of health of a small urban district council is prevented by holding this office from being elected a county councillor in the same county.

*** We understand that the medical officer of health of an urban district council is an entirely independent officer so far as the county council is concerned and not under its control. It appears that half his salary is repaid to the urban district council by the Local Government Board, and the channel through which this moiety is paid to the urban district council is, we believe, the county council; but so far as we know the money is not derived from the county rates, and the county council can in no way be considered to contribute to the salary of the urban district council M.O.H. We therefore see no reason why the M.O.H. of an urban district council should be debarred from election as a county councillor in the same county.

SUPERANNUATION OF MEDICAL OFFICERS, SCOTLAND.

MR. J. M. MORTIMER (Honorary Secretary, The Scottish Council of Local Government Officers, Paisley) writes: With reference to "Efficiency's" letter in your issue of April 12th, p. 470, may I be allowed to state that the Scottish Council of the Local Government Officers are anxious to present an absolutely united front when they make representations to the Secretary for Scotland on this important question? All Local Government officials are therefore urged to become members of our association so that we may go forward as a united body. Branches of the association have been formed in Edinburgh, Glasgow, Dundee, Aberdeen, Paisley, Greenock and Inverness. Either the secretary of any of these local branches or myself will be pleased to supply further information regarding the association's activities.

SPENGLER'S "GRIPPE I.K."

DR. ALEXANDER FRANCIS (London, W.) writes: Some time ago Dr. Carl Spengler of Davos sent me a sample of an I.K. he had prepared for the current influenza outbreak, on the same principle as his well known I.K. for tuberculosis. I found it so valuable, and others to whom I gave samples reported so favourably, that I urged Dr. Spengler to send a supply to this country to be available for general use. He has now done so, and I have placed it in the hands of Messrs. Allen and Hanburys (7, Vere Street, W.1), from whom it can be obtained. In the reports which I have received most satisfactory results were obtained in cases of severe septic influenzal pneumonia. In some instances one dose only was required. In a number of cases an apparently typical attack of influenza was caused to abort within a few hours by a small dose. This I.K. is best given by hypodermic injection (0.5 to 1 c.cm.), but it can be taken with less effect by the mouth. I am told that the results obtained by the "Grippe I.K." in Switzerland have been extraordinarily good.

THE CONTROL OF SYPHILIS.

M.B., D.P.H. writes: Might I suggest that private practitioners be supplied through the venereal centres with salvarsan or its substitute for the treatment of patients suffering from syphilis? There are many patients who cannot afford either the publicity of a venereal disease clinic or the expense of treatment privately, and these, I contend, will prove a great source of danger to the community. The drug could be supplied on written application from the practitioner, just as diphtheria antitoxin can at present be obtained gratis through the Public Health Department. If thought necessary the doctor, before he can be supplied with the drug, might be required to possess a certificate of competence in the administration of this special treatment.

INTERNATIONAL PHARMACY.

THE dream of every French pharmacist with a successful specialty is to foist it on to the British public, and as many of these specialties are elegant, well thought out, and practically convenient, their efforts, in association with the necessary publicity, are often attended by a considerable measure of success. This is as it should be, but, as the Irishman remarked, the reciprocity must not be all on one side. French regulations bearing on the introduction of foreign pharmaceutical preparations are extraordinarily severe. For instance, foreign-made serums are not admitted on any condition whatsoever, on the ground that their efficacy and the soundness of these preparations cannot be controlled. Then, again, these regulations forbid the importation of even a pharmacopoeial product—such, for example, as the pil. ipecac. cum scilla—nay, even such an innocent combination as extract of malt and cod-liver oil is tabooed, simply because the Superior School of Pharmacy has so recommended. Now our allies ought not to have it both ways. If the French practitioner in England be left at liberty to prescribe such French preparations and specialties as he please the English practitioner in France should enjoy the same liberty of action.

THE appointments of certifying factory surgeons in the following districts are vacant: Barrowden (Rutland), Dursley (Gloucester), Longton (Lancaster), Mold (Flint).

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Seven lines and under	0	6	0
Each additional line	0	0	9
Whole single column	4	0	0
Whole page	12	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Wednesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.